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QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

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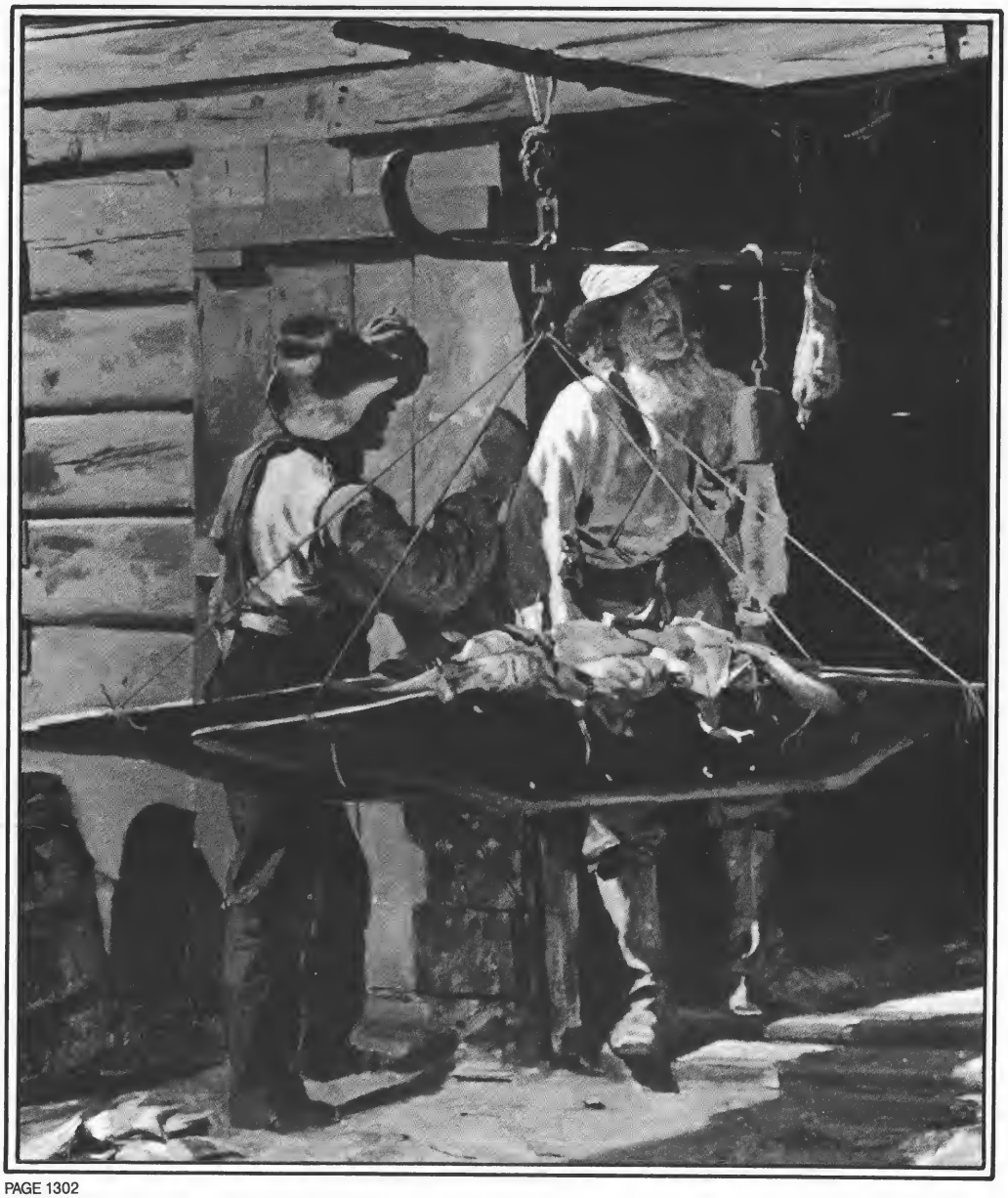
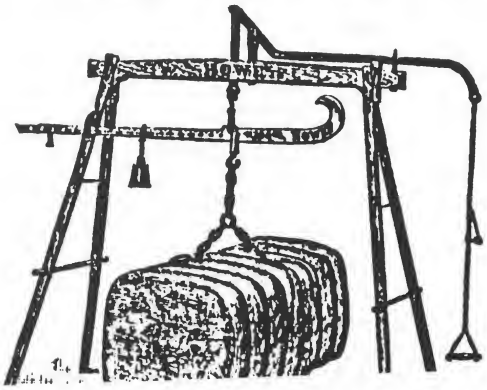
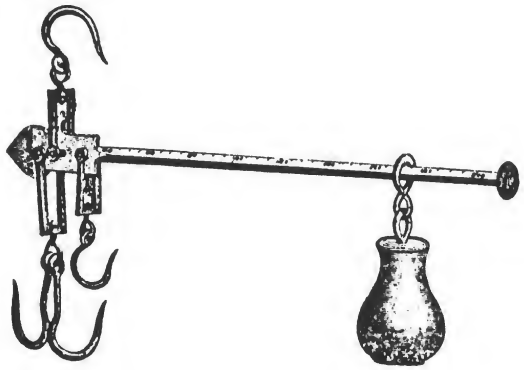


Cover Picture

This American genre painting "Farmers Weighing Fish" by J.G. Brown was executed in 1878, and was auctioned by Weschlers of 905 E Street, N.W. Washington, D.C. in October 1988 (who kindly gave permission for its reproduction in EQM). It was painted in shades of sepia, yellow ochre and grey, with touches of terracotta, which gives a very hot, exhausted look that is typical of American painting. In any case, scale collectors would have identified it as American from the curved tail on the steelyard, but who can tell us what the wooden object is, that is being used as a pan to hold the fish? It is overly large and cumbersome, but the cords are thin and not suitable for large loads. Why were the fish being weighed in full sunshine? They would rapidly become inedible - as would the chicken hanging in the doorway.

The American steelyard was not designed to be turned over to utilise the potential for a second set of finer or coarser graduations. From the middle of the 18th century in Europe a second load-bearing hook was incorporated at a different distance from the suspension hook, so that a greater range of weighing was possible, on the one instrument.





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John Gardner's Coin-Scale

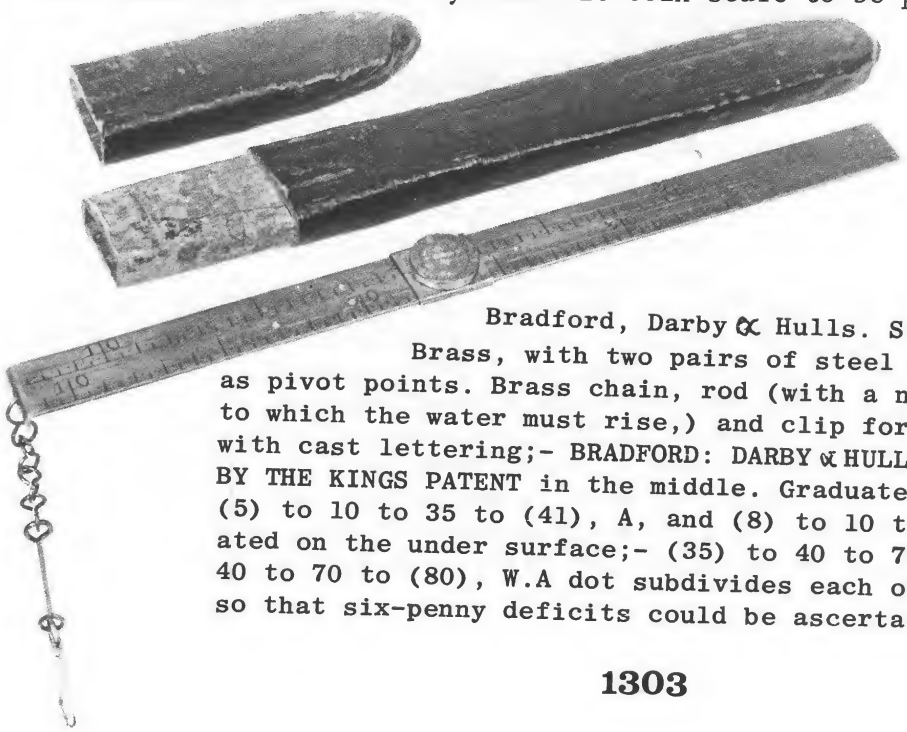
A Scottish Gold Coin Scale of 1773

by D J Bryden

To a boy chorister, the penitential services of Lent were a sore trial. The seemingly interminable prayers of the Anglican Litany were said. There was not even the joy of singing to relieve the pressure on one's knees. I hoped in vain for an aged cleric who would depart from the text of the Book of Common Prayer and insert something interesting like the 10th century supplication which I had heard of in history lessons at school, 'From the Fury of the Norsemen, Good Lord, deliver us.' This at least seemed to have a closer relationship to the real world than heresy, vain-glory and fornication- ah! the lost innocence of youth! My father used to exclaim,'From Hell, Hull and Halifax, Good Lord, deliver us.' Twenty years on, I realised that what I had thought was my father's typical West Riding attitude towards rival towns, was not his own doggerel but a similar liturgical interpolation based on historical fact. Hull and Halifax were Yorkshire towns where lived notorious coiners who clipped, filed, chemically depleted and sweated gold coin and put counterfeit specie into circulation. Their illegal activities were a prime reason for the introduction of new standards for the British coinage in the 1770s.(1)

Michael Crawforth emphasised that the state of the gold coinage at this time was such that it was necessary for merchants not only to count their change but to weigh it. Furthermore, weight alone was not sufficient, as the more ingenious forgers used alloys that had the correct weight. Thus, some coin balances included gauges so that the dimensions of the coin could be checked, whilst others were calibrated for hydrostatic weighing; the density (and thus purity,) of the coin being found by the weighing in air and then in water.(2)

The 1753 design for an unequal arm coin balance of William Bradford and Jonathan Hulls was the first hydrostatic coin scale to be patented.(3) I first read



Bradford, Darby & Hulls. Stimulated Gardner's ideas. Brass, with two pairs of steel points rivetted on to act as pivot points. Brass chain, rod (with a notch cut to show the level to which the water must rise,) and clip for the coin. Brass slide with cast lettering;- BRADFORD: DARBY & HULLS round the edge and;- BY THE KINGS PATENT in the middle. Graduated on the top surface;- (5) to 10 to 35 to (41), A, and (8) to 10 to 35 to (47), W. Graduated on the under surface;- (35) to 40 to 70 to (74), B and (38) to 40 to 70 to (80), W.A dot subdivides each of these shilling marks, so that six-penny deficits could be ascertained. Length 95mm.

of this instrument when I was researching the history of the Scottish instrument making trade.④ In 1773 a Glasgow mathematical instrument-maker, John Gardner, advertised that he had designed and made an improvement of Bradford's instrument. At the time, I had not seen either an example of Bradford's scale, nor the version made in Glasgow by Gardner. I presumed that the design was similar to the conventional coin beams made by metal workers in London, Birmingham and elsewhere. The sight of one of Bradford's instruments might have suggested that the presumption was unlikely. When I subsequently had the opportunity to examine one of John Gardner's instruments, it was clear that I had been wrong.

The great recoinage that began in 1772 extended the market for the makers of coin scales. For a period, British coin minted prior to the reign of George III, coin minted earlier in that reign, and the new coinage minted from 1772, were all legal tender despite differences in weight. Officially, guineas minted prior to 1760 passed at 5dwts 3grs, George III guineas minted up to 31st of December 1771 passed at 5dwts 6grs, and those minted after 1st January 1772 at 5dwts 8grs least current weight, although theoretically minted at 5dwts 9 4/9th grains. In any event, clipping and counterfeiting made the populace acutely aware that there was much bad money in circulation.⑤ The conventional equal-arm beam scale, whilst well able to detect light coin, could not identify counterfeit specie. This was the advantage of the hydrostatic instrument patented two decades earlier, and this was the feature which London mathematical instrument-makers like George Adams⑥ and Benjamin Martin⑦ incorporated in their designs.

The mathematical instrument-maker John Gardner (1734-1822) served as senior journeyman to James Watt in the business which the latter started in Glasgow in 1757. Gardner set up as his own master in or shortly before 1773, when Watt was about to leave Glasgow to join Matthew Boulton in Birmingham⑧ and concentrate on the design and manufacture of the steam engine with a separate condenser.⑨ In the Glasgow Journal newspaper for 9th September 1773, John Gardner inserted the following advertisement:-

GOLD COIN
JOHN GARDNER
MATHEMATICAL INSTRUMENT
MAKER
Opposite to BELL'S-WYND, CANDLERIGGS
Glasgow

With the assistance of JAMES BROWN, well known for his skill in hydrostatics, by making Glass Bubbles for proving the strength of Spirits, and the specific weight of Water, Lees, Vitriol &c, which have been so much admired both at home and abroad, has so IMPROVEN BRADFORD'S STATICAL Instrument for weighing and detecting frauds in Light or Counterfeit Gold Coin
-As that in the space of ONE MINUTE, you can weigh any piece of Gold from 4s 6d to a 36s piece, and upwards if required, in Penny Weighs, Grains, and under, while at the same time this Instrument shews what each piece is worth, at the rate of £3 17s 10½ per Ounce, which is the present value of Cut or Defaced Money. The Peculiar Excellency of this Instrument is that you can in the same space of time discover whether it is a Counterfeit or Standard Gold, and what degree of Alloy it contains as well as the Quality of the Alloy, whether Silver, Copper, Brass or Tin, that is mixed with the Gold,- The whole is so portable that it only weighs about one ounce, and may be easily carried in a letter case or Pocket Book.

They are sold from 3s to 10s 6d, according to the Elegance or Plainess of the Workmanship, and the more or less extensive properties of the Instrument,- Purchasers who chuse it, may have their names neatly put upon the Instrument gratis, by that skillful Engraver Mr Andrew Ready in this town.
NB As some of the above Instruments have been Purchased of Mr Gardner by some tradesmen in Town, whose profession is quite different from Mathematical Instrument-making (to which branch the Machine alone belongs,) and have begun to make them, from the patterns they have obtained from him, he is obliged in Justice to the Public and himself to Caution them to beware of Impositions by Ignorant Mechanics, and for this reason, all that are made by him are stamped with his Name.

Two months later Gardner inserted a further advertisement in the same newspaper, indicating that he had just published an instruction book which would be supplied gratis to all who had and would purchase one of his gold coin scales.[10] In 1971 that appeared to be all that could be found about Gardner's version of the Bradford and Hulls Hydrostatic coin balance. Then, in the summer of 1975, one appeared in a Sotheby's auction, complete with its leather carrying-case and the printed pamphlet of instructions.[11] Naturally the museum in Scotland, where I had previously worked, made a strenuous attempt to acquire such a rare Scottish item, but it was not to be. Passing through the auction rooms, an executive of a business with off-shore interests in gold coin saw the lot being auctioned and decided that it was just the thing to buy as a present for one of his overseas associates, bidding £170 against the estimate of £80-£120. I later learned that the lot had only been included in the sale as a favour to a customer who had found it inside a long-case clock purchased from the same auction rooms earlier in the year!

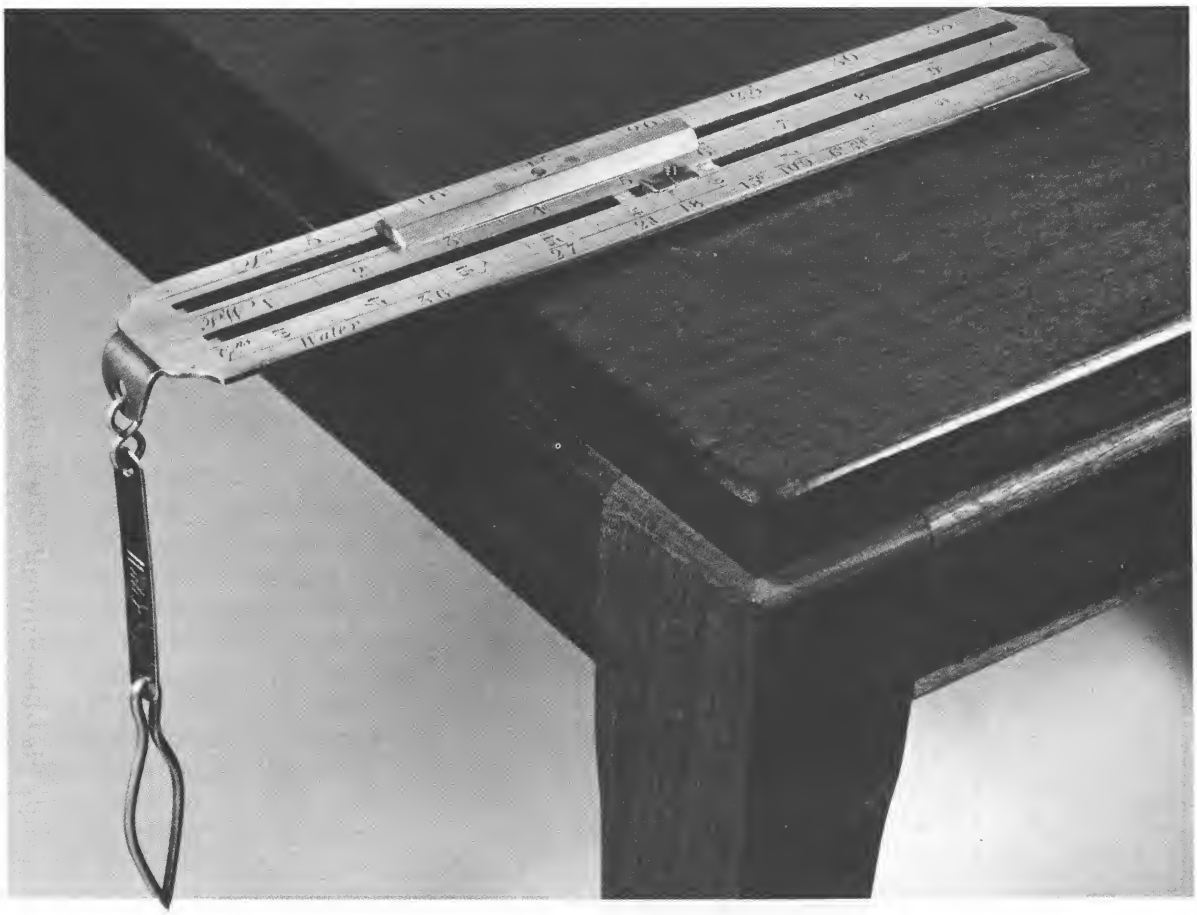
Through the good offices of the auction house, a letter was sent on to the purchaser and, some months later, a generous reply came through the post. The result was a short loan of the scale and the booklet. As all collectors know, there is no substitute for handling the real thing. I expressed my gratitude to the owner then, and I do so again now, and to the Curator of the Whipple Museum of the History of Science in Cambridge, with whose kind permission the accompanying photographs are published. I must have first met Michael and Diana Crawforth at about this time, because my notes include a scale drawing and sketches of the instrument- in emulation of the fastidious attention to detail that I had observed when they came to Cambridge to examine the folding coin balances in the Whipple Museum.

John Gardner's scale is well-made from sheet brass, 169mm long, 24mm wide, (nearly 7 inches long,) with a pair of slots in which slide adjustable counterweights. On the underside is engraved the maker's name: *J Gardner fecit*. The heavier counterweight has a fiducial mark reading against scales of Shillings from (4s 6d to) 5 to 35 (to 36s), by 5 subdivided to 1, with marks at 10s 6d and 13s 6d because, to quote the instruction book, 'there are pieces of coin of that exact value' and Pennyweights from 1 to 9 by 1 subdivided to ½. The smaller and lighter counterweight has a fiducial mark that reads against the Grains scale; 19 to 1 (to 0) by 2, subdivided to a ½ but as the instruction book claimed, 'the Instrument can easily be set at the quarter of a grain.' The Water scale also reads to the fiducial mark on the smaller counterweight. It is calibrated for gold coin of nominal worth in shillings and pence from 36 (the Johannis or Portugal Piece) through 27

(Portuguese Moidore) 21 (Guinea) 18 (half Johannis) 13s 6d (half Moidore) 10s 6d (half Guinea) 9 (quarter Johannis) 6s 9d (quarter Moidore) 5s 3d (quarter Guinea) to 4s 6d (⅛ Johannis.) This calibration is a reminder that such were the inefficiencies of the Mint in the middle decades of the 18th century that the gold coin of Britain's major trading partner, Portugal, were more likely to be in circulation than the official coin of the realm.

When weighing in air the smaller slide is set at zero on the grain scale and the larger counterweight set at the face value of the coin being weighed. The coin is hung in the pincers and the scale set with the pivot points close to the edge of a table. Then;-
'if the back end of the Instrument rises gently from the Table and will not rest upon it, your piece is just weight. But if the tail of the Instrument rests on the Table, the money is light, and to know how much light it is, bring forward the grain-slider until the tail rise..... and the number of grains the slider has come forward, is the weight deficient.'
A reduction in value of 2d per grain under weight is then made.

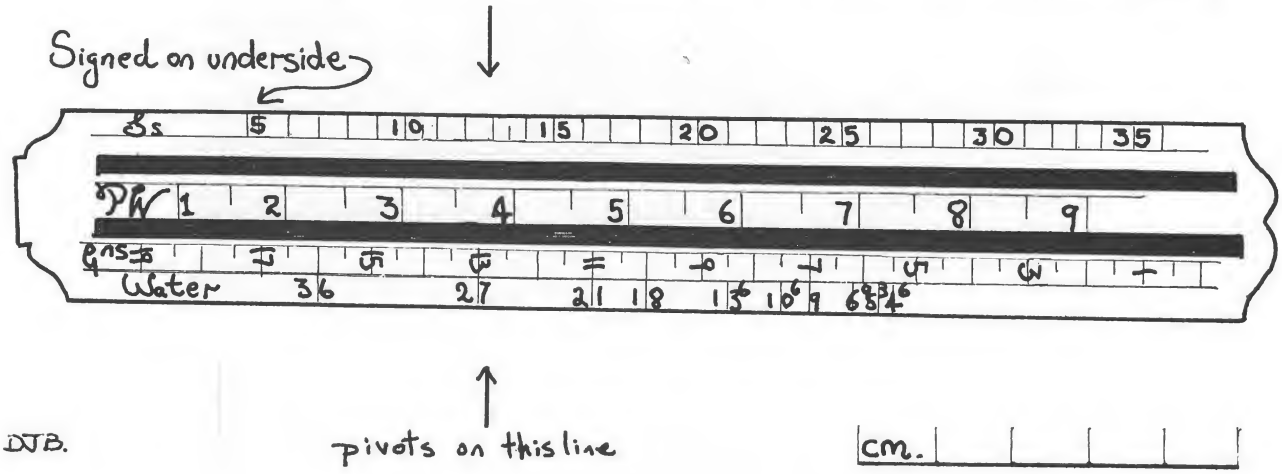
When weighing an apparently full-weight coin in water, the procedure requires some dexterity. The larger weight is set at the face value of the coin and the smaller at the same value on the water scale. The adjacent calibrations indicate that a guinea, for example, would be expected to be 11 grains lighter in water than in air. The coin is not weighed by immersing it in water, but by



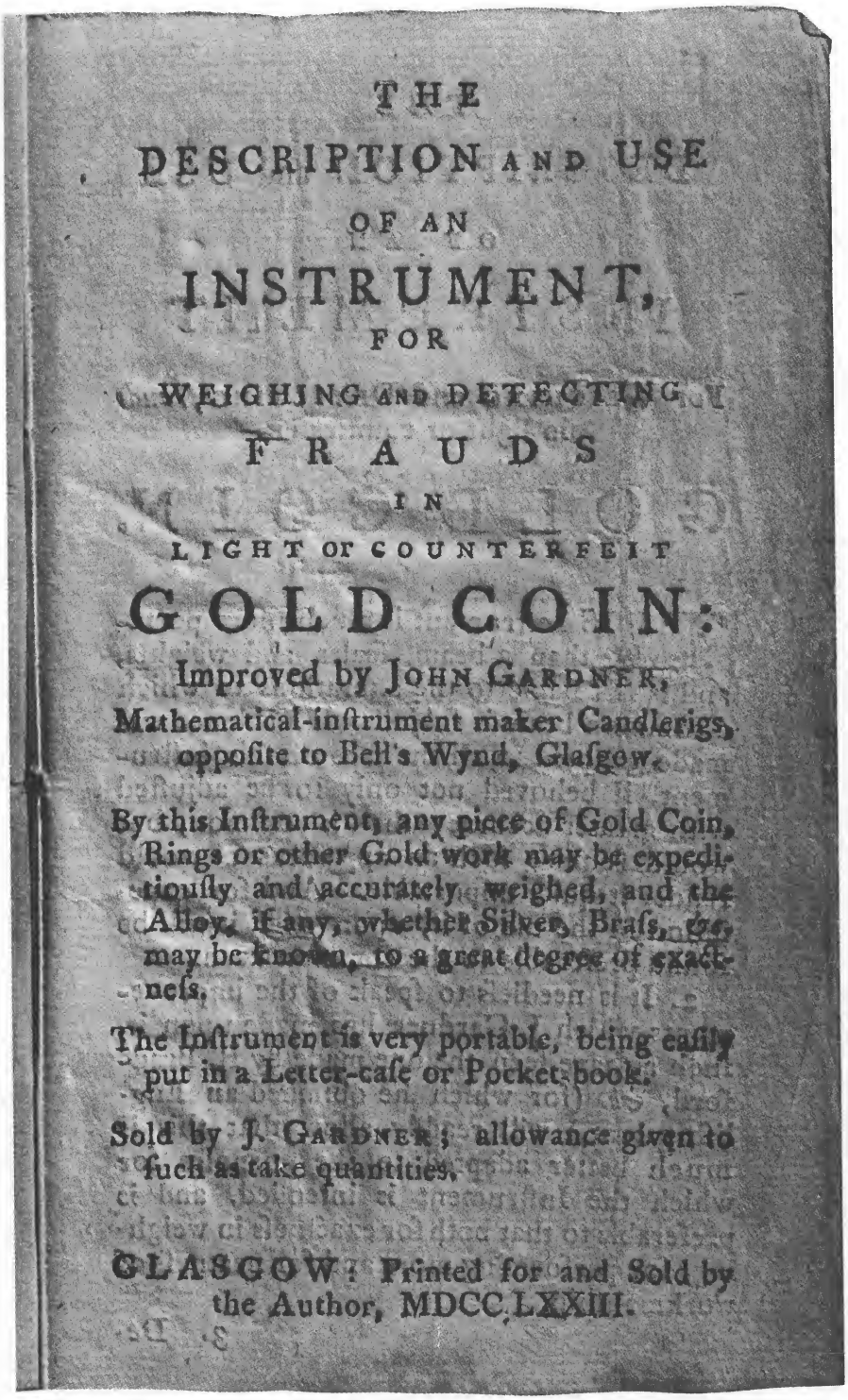
bringing the container holding the water up under the coin to immerse it. The instrument is calibrated with a fiducial mark on the suspension bar which holds the pincers. (This prevents the user from including part of the weight of the suspension bar in his calculation of the weight of the coin.) If the 'tail' of the balance moves to rest on the table before the water level reaches that mark, 'there is some baser metal mixed with the gold.' By adjusting the smaller weight until the instrument is in balance when the water is at the fiducial mark, the hydrostatic underweight of gold in grains is noted. On the assumption that the alloy is silver, Gardner advises a reduction in value of 4 shillings per grain division.

When checking the purity of a worn and underweight coin, a little mental arithmetic is required. Gardner indicated that the gold used for coins loses an eighteenth of its weight in air when immersed in water, so that, for every 9d undervalue, (ie $4\frac{1}{2}$ grains under weight in air,) the grain slider must be set under-weight by $\frac{1}{4}$ on the grain scale. This arithmetic could have been avoided if the water scale had been fully calibrated in £sd rather than merely marked with the values of gold coin in circulation, though, as can be seen from both the photograph and the drawing, this would have required very fine subdivisions. Perhaps this is the 'improvement' mentioned in a brief advertisement at the end of the pamphlet 'which will save a great deal of trouble in weighing with water.'

In principle, the Gardner hydrostatic scale appears to provide an ideal solution to the problem of worn or counterfeit coin. However, the actual position in 1773 made matters rather more complex. Firstly, as has been indicated, guineas of three different weights were officially permitted to pass. The instrument was calibrated for use with the older coin minted prior to 1760. This was the coin which was both worn in use, and subjected to induced wear by coiners and was particularly suitable for counterfeiting. The redemption value was £3.17s.$10\frac{1}{2}$d per ounce, and the coin passed at 5dwt 3grns. The user had to make his own adjustments for the heavier guineas minted from 1760 to 1771 and the even heavier 1772 guinea. For hydrostatic weighing this meant interpolating corrections both for the type of coin, and for the degree of any underweight, a matter on which the instructions are not particularly helpful, and which introduces an additional degree of complexity in application. Furthermore, the apparently simple way in which the bullion value of



counterfeit coin is estimated, is made more complex by the fact that the counterfeiter may not have used silver to make-up the weight, but copper, tin or other varied alloys of copper and zinc, brass; or any combination of these. Now whilst Gardner did print a table indicating how the degrees of underweight in hydrostatic weighing could be used to distinguish the counterfeit metal, he implicitly accepted that whilst silver could readily be dis-



THE
DESCRIPTION AND USE
OF AN
INSTRUMENT,
FOR
WEIGHING AND DETECTING
FRAUDS
IN
LIGHT OR COUNTERFEIT
GOLD COIN:
Improved by JOHN GARDNER,
Mathematical-inſtrument maker Candlerigs, oppoſite to Bell's Wynd, Glaſgow.

By this Inſtrument, any piece of Gold Coin, Rings or other Gold work may be expeditiouſly and accurately weighed, and the Alloy, if any, whether Silver, Braſs, &c. may be known, to a great degree of exactneſs.

The Inſtrument is very portable, being eaſily put in a Letter-caſe or Pocket-book.

Sold by J. GARDNER; allowance given to ſuch as take quantities.

GLASGOW: Printed for and Sold by the Author, MDCC.LXXIII.

tinguished, the other metals and any complex alloy were difficult to distinguish. No explicit method of ascertaining inherent bullion value was given for counterfeit coin when the adulterant was not clearly identifiable as silver. (12)

Under the Light Coin Act of 1773 and the Recoinage Act of the following year, all but coin minted after 1772 were to be called in for reminting over a period of years. Only after the 1776 Proclamation were light guineas demonetised. By this date Gardner would have needed to produce a re-calibrated instrument if he intended to continue its sale. Furthermore, as a result of the recoinage begun in 1772, most of the hitherto common Portuguese coin was sold to the Mint as bullion and ceased to circulate.

Thus the need for an instrument able to cope with a wide range of specie was further reduced. It may be an indication of the sales that Gardner achieved with the 1773 instrument, that he does not appear to have continued to make the hydrostatic gold coin balance. At least it was not mentioned in an advertisement listing his wares inserted in the Glasgow Mercury newspaper of 1st July 1779, nor in an even more extensive advertisement published in the Glasgow Courier for 3rd March 1792, though the latter does indicate that the shop sold specialist weighing devices like 'Grain beams, for determining from a sample, the weight of a bushel' and 'Quadrants for weighing cotton and linen yarn.'

John Gardner's instruction book also described a cheaper instrument with 'a scale of shillings the whole length, and a scale of grains only half the length,.....The one at the end of the Instrument marked air, the other beginning a little beyond the place where the air-scale ends, is marked water.' I have never seen one of these, nor any of the copies that their designer claimed were being made by other Glasgow metal workers in 1773. Any member of ISASC who has seen one, please write to tell the editor, now!

1...R Ruding, Annals of the Coinage of Britain II (London 1817) 479-494. J Craig, The Mint (Cambridge 1953) 242-246.

2...M A Crawforth, Weighing Coins,English Folding Gold Balances of the 18th and 19th centuries (London 1979) 1-8, and more fully in his 'Counterfeit Coin Detectors and the need for their use in England in the 18th and 19th centuries,' EQM 264-277.

3...British Patent 686 (1753) W Bradford and J Hulls, 'Machine for weighing gold coin.' See also the booklet which the patentees and the maker, R Darby, (all from the same Gloucester town,) sold with the instrument, 'The Gentleman's and Traders' Guide, containing the description and Use of a new invented Instrument for preventing fraud by counterfeit Gold.' (Worcester 1753) or the later issue (Stratford 1756).

4...D J Bryden, Scottish Scientific Instrument-makers 1600-1900, (Edinburgh 1972) 20.

5...Both the historical background and the complex legislative position is admirably detailed in N Biggs, 'English Coin Weights, part 7' EQM 1060-1066, and part 8, EQM 1079-1086.

Editor's note;- 24 grains in each pennyweight, (dwt) Each grain was worth 2 pence. There were 12 pence in each shilling, and 20 shillings in each pound (£)

6...Adams' coin scales are listed on the end paper of T Hatton's Essay on Gold Coin...with a description of the most improved weighing instruments, (London 1773.)

7...B Martin, The Monied Man's Vade Mecum, being an explanation of the nature structure and use of a new portable steelyard for weighing gold coin, (London 1773.) See also M A Crawforth, The Monied Man's Vade Mecum, EQM 299-303.

8...Boulton and Watt used the Soho Foundry, later the premises of W and T Avery.

9...For the history of the business established by John Gardner see T N Clarke, A D Morrison-Low and A D C Simpson, Brass and Glass: Scientific Instrument Making Workshops in Scotland as illustrated by instruments from the Arthur Frank Collection in the Royal Museum of Scotland (Edinburgh 1989) 164-179. For Watt's activities as an instrument-maker see Bryden op. cit. (4) 25-27 and passim.

10..Glasgow Journal No. 1687, 11th November 1773.

11..Sotheby and Co. (Sale of) Clocks, Watches and Scientific Instruments, 16th June 1975, lot 57.

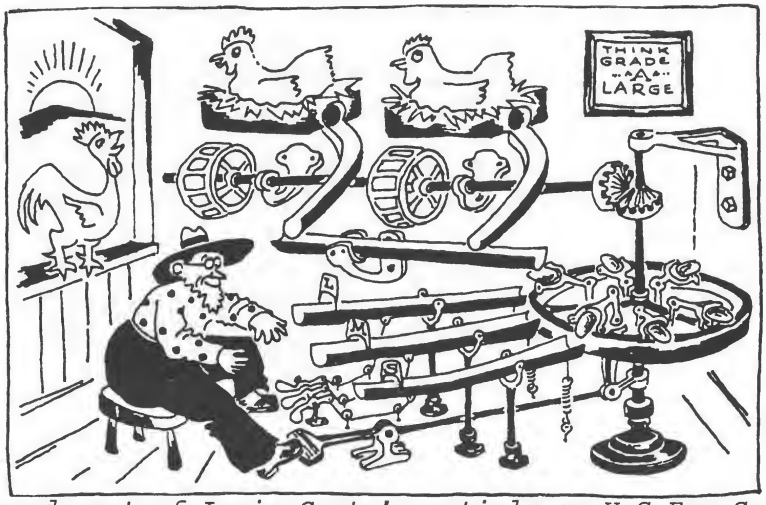
12..When a coin proved to be grossly adulterated, newspapers of the period reported that such coins were commonly passed on when no weighing was likely to be involved, in places such as drinking halls, race courses or markets. Honest citizens took the coins to a goldsmith, who gave slightly lower than the value of the gold content, and who, in turn, took the coins to the Mint to receive the bullion value of the gold.

Bradford, Darby and Hulls had second thoughts about their coin balance. This second version was not a bismar like the first patented version. It was a moving load steelyard. It had one pair of feet (under 17½) and a minute steel beam running in a brass box soldered to the under-side of the left hand end of the brass beam. When weighing in air the steel beam was pushed in, and when weighing in water the steel beam was pulled out. This solution permitted the user to read off the exact value of the coin in shillings and three-pences, regardless of the date of the minting of the coin. The user could decide for himself whether the coin was legal tender. All the gold coins currently in circulation in Britain could be weighed, up to the 36/-, on the one surface, and the £3: 12s could be checked if the extra brass weight was slipped on to the right hand end of the brass beam. Length 95mm. Box papier mache painted black.

Egg Scales Part 5

GOLDBERGIAN VARIATIONS ON THE AMERICAN EGG SCALE

LOUIS COSTA



This is the second part of Louis Costa's article on U S Egg Scales. This comprehensive list of American egg scales shows the vigour, vitality and variety of designs thought of by Americans outside the tradition of conventional scale-making. Because the article is illustrated with black and white pictures, it is difficult to visualise the vivid colours used in many combinations to high-light the extraordinary shapes used. A problem for historians is the lack of information on dating of American egg scales, and any additional facts would be welcomed by Lou Costa and by the editor. If the claims of 'patent applied for' are true, then it might be possible to trace the date of the applications.

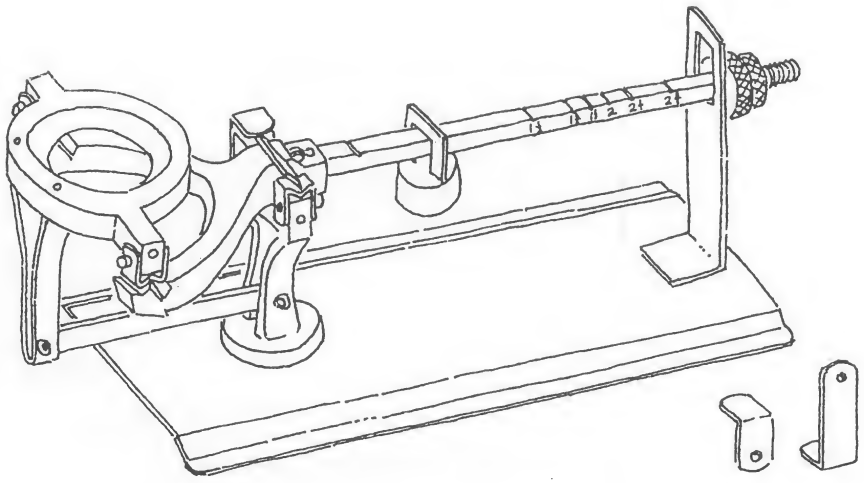


Fig. 13. Unsigned, USA. Painted mottled brown-gold. Cast bronze egg cup. Beam iron with 2 knurled brass nuts. Beam marked 1½, 1¾, 17/8, 2, 21/8, 23/8, 23/8. Base sheet iron bent for foot on long side 9 in. (22 cm.) Half-roberval and steelyard.

Many scales were a steelyard with a sliding weight captive on the beam - simple, covering the range of egg grades, relatively easy to clean, quick to adjust for each egg as long as the weight was pushed back to the lightest weight between each weighing, cheap to manufacture and boring to look at!

AQ..Unsigned American. Half roberval and sliding weight steelyard. (Fig 13)

AR..ABF, made by Mount Tacoma Mfg Co. Tacoma, Wash. 19-24 oz per dozen. Weight wrapped right round the beam and telescoping in and out. (MAC 14)

*AS..**Reliable** Egg Grader made by Reliable Mfg Division of James Mfg Co. Los Angeles, California. Wood base, steelyard. (MAC 15)*

AT..Reliable Egg Grader. More modern than the above. Metal base. Engineering drawings Fig 14, (photo 6.)

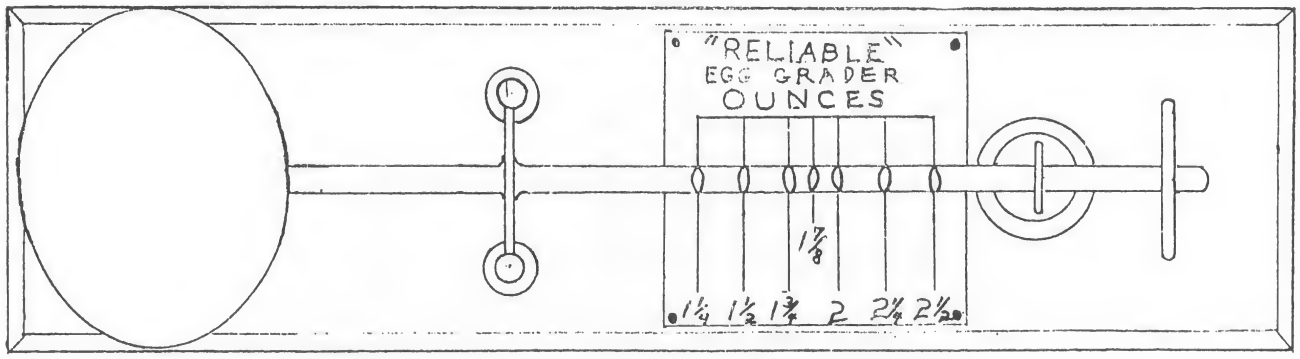


Fig. 14

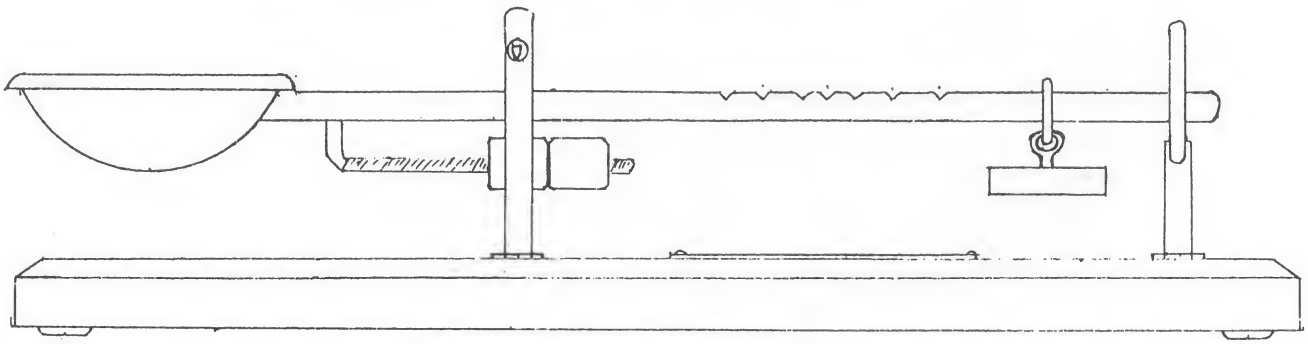
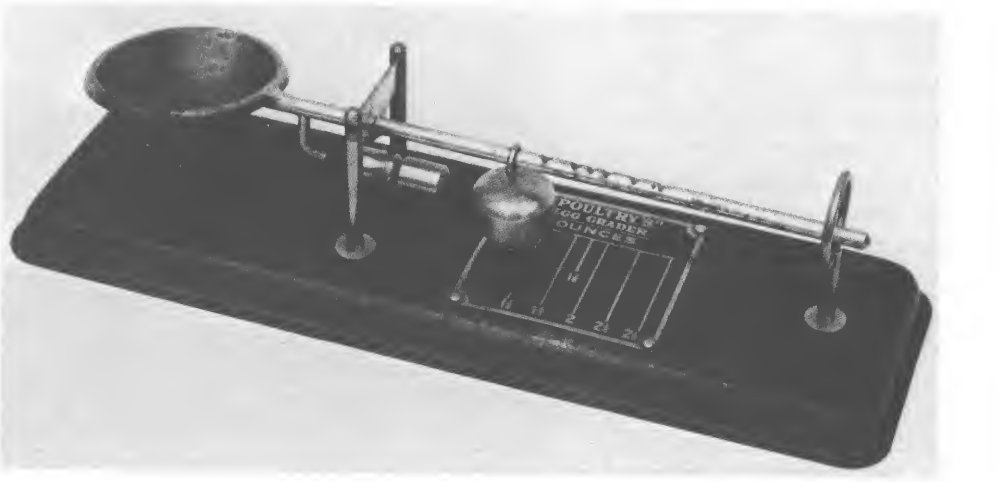


Photo. 6. Reliable Egg Grader. 1¼-2½ oz. Base 13½ ins long (34 cm.) Rocker.



AU.. Oakes Mfg, Tipton, Ind. Price $1.15. 18-26 (oz per dozen) (MAC 27)

AV..Champion Egg Scale, Carlstedt Mfg Co. Edmonds, Washington. Mass stabilised pan and steelyard. (MAC 30)

AW..Champion Egg Scale. Same as above but cup is cut away and the lead is made in a separate mould and poured round the strips of the egg cup. Not illustrated.

AX..Save-all by Brower Mfg Co. Quincy Ill. Very thin sheet iron, green painted base, yellow beam. Sliding weight between the two strips that form the beam. Hole in the base was to check the egg size in relation to the weight. Directions glued to the underside, shown in Fig 15. Rubbing no. 2 (MAC 41)

The pendulum used with a graduated arc gave the user the easiest job. The egg had only to be handled once to put it on the scale and once to remove it. The arc was normally placed conveniently so that it could be used swiftly and accurately, and was often coloured in bands to aid quick identification. Most had the cup placed above or beside the mechanism without obstructions. Most look "cheap but cheerful".

AY..Kahlert Mfg Co. 1822, Franklin Ave. SE MPLS, Minn. Half roberval and hanging weight, with graduated arc. (Photo 7)

AZ..Unsigned USA. Possibly for eggs. Graduated in points?? Pendulum. (Photo 8)

INSTRUCTIONS

Average eggs range in weight from 18 to 32 ounces per dozen. The purpose of "Gradenway" is to show instantly the "dozen weight" of eggs; also standard sizes. To weigh — simply put the egg in hole on the beam and adjust the weight until egg end of beam lowers, and this will show the weight in ounces to each dozen of eggs.

Much time and labor can be saved by placing balance at minimum weight desired, and eggs that tilt the beam down are that weight or more per dozen eggs and eggs that will not do so are of the No. 2 grade.

The grading hole is the acceptable size of eggs now being used by produce buyers. Eggs showing 22 ounces or more and NOT passing through the hole — are considered No. 1 Selects. Eggs that pass through the hole, or weigh less than 22 ounces are No. 2 grade.

The operation is very simple and by weighing and grading your eggs you will be assured of maximum prices at all times.

10.M 3-16-34

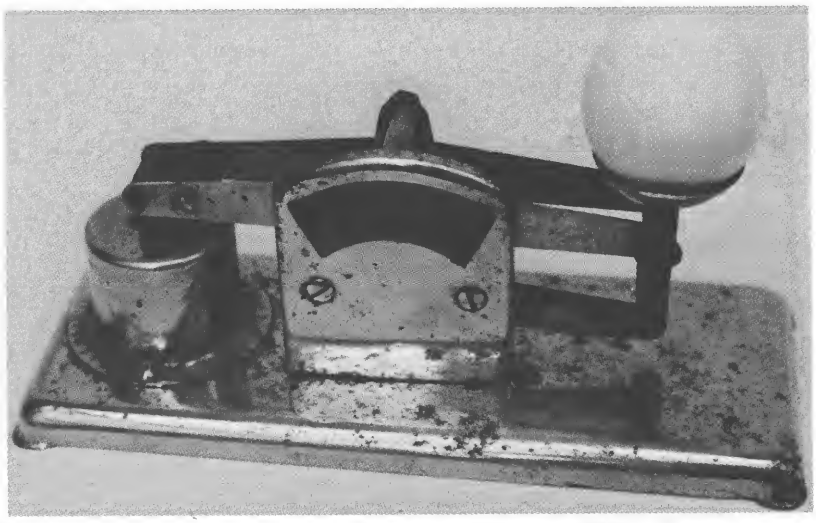


Photo. 7. Universal Egg Grader made by tne Kahlert Mfg. Co, 1822, Franklin Aye, SE MPLS, Minn, Pat. Applied For. Weight inside the drum on the left. 16-36 oz. per dozen. Roberval & hanging weight.

BA..Jiffy-Way Inc. Owatonna, Minn. Patent 1940. Pendulum. (MAC 2)

BB.. Jiffy-Way, sold by Bower Mfg Co. Not illustrated.

BC..Jiffy-Way, Sold by Farm Master. Not illustrated.

BD..Jiffy-Way, sold by Purina. Not illustrated.

BE..Reliable Automatic Dial Egg Scale. 16-40 grades. Graduated arc shown as Rubbing no. 11. Pendulum (MAC 3)

BF..Zenith Egg Scale made by O.W. Bedell, Earlville, NY. Cast iron base. Bolts had red rubber inserts for impact absorbtion. (MAC 9)

BG..Zenith Egg Scale, same as above but with aluminium base, cast dial and cast support arm. Not illustrated.

BH..Zenith Pedigree Scale, Earlville, NY. Suspended pendulum. (MAC 39)

BI..Zenith Pedigree Scale, same as above but supplied with a stand. Not illustrated.

BJ..Zenith Egg Grader, with brass pointer, brass half roberval linkage and brass cup support, brass levelling screw and impact bolts with black rubber caps. This scale with its blue aluminium and brass looks like sculpture for the coffee table. Not illustrated.

BK..Mascot Egg Grading Scale made by Prospectus Mfg Co. Minneapolis, Minn. Pendulum. (MAC 54)

BL.. Mascot Egg Grading Scale, sold by Oakes Mfg Co. Inc. Tipton, Indiana. Integral weight and beam. (MAC 26)

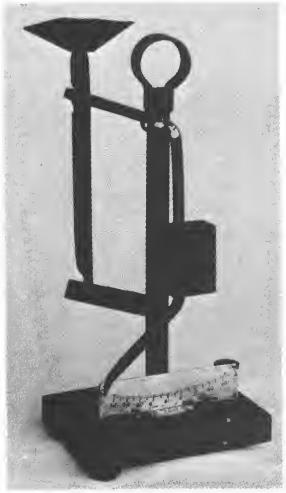


Photo. 8. Is this an egg scale? It is graduated 0-90. It is made of folded sheet.

BM..Mascot Egg Grading Scale, same as above. Sold as the premier. Not illustrated.

BN..Mascot Egg Grader by Prospectus Mfg Co. Minneapolis, Minn. Cast aluminium cover over pendulum. (MAC 50)

BO..Unique Egg Grading Scale, by Specialty Mfg Co. St Paul, Minn. Well designed and constructed, compact, easy to clean because the beam covers the fulcrum. Holes at 19 and 23 oz for stops. Pendulum (MAC 32)

BP..Unique Egg Grading Scale. Same as above but with aluminium arc deeply stamped with black letters for oz per dozen and points (·70 to 1:10, purpose unknown). Holes at 20 and 23 oz for stops. Egg cup, support and linkage of aluminium. Beam light grey and base dark grey. Pendulum. Not illustrated.

BQ..Unique Egg Grading Scale, same as above except that the arc was sheet iron painted cream, the cup, support and linkage were silver grey sheet iron, beam medium brown and base dark brown. Pendulum. Not illustrated.

BR..Unsigned American. Similar to above but with wider beam and two large round holes cut in it. Arc attached to the beam. An extra bracket 4 1/4" high gave a read off position for the arc. Arc graduated in doz and points. Levelling ball on base same as Brower (BT) below. Painted cream and green. Pendulum. Not illustrated.

BT..Brower, Ill. Same as above. A hole in the arc at "23" through which a spring wire (attached at the rear) could be moved to form a stop. A ball levelling device rivetted to the base. Not illustrated.

BU..AA Featherlite Scale. CSH Industries Inc, Oak Lawn, Ill. Pendulum (MAC 47)

BV..Brower Egg Scale. Pendulum. (MAC 57)

BW..Brower, Quincy, Ill. Pendulum. (MAC 60)

BX..H.J. Otto Mfg Co. Evansville, Ind. Poorly designed. Badly Constructed. The ugliest scale in my collection. (Fig 16)

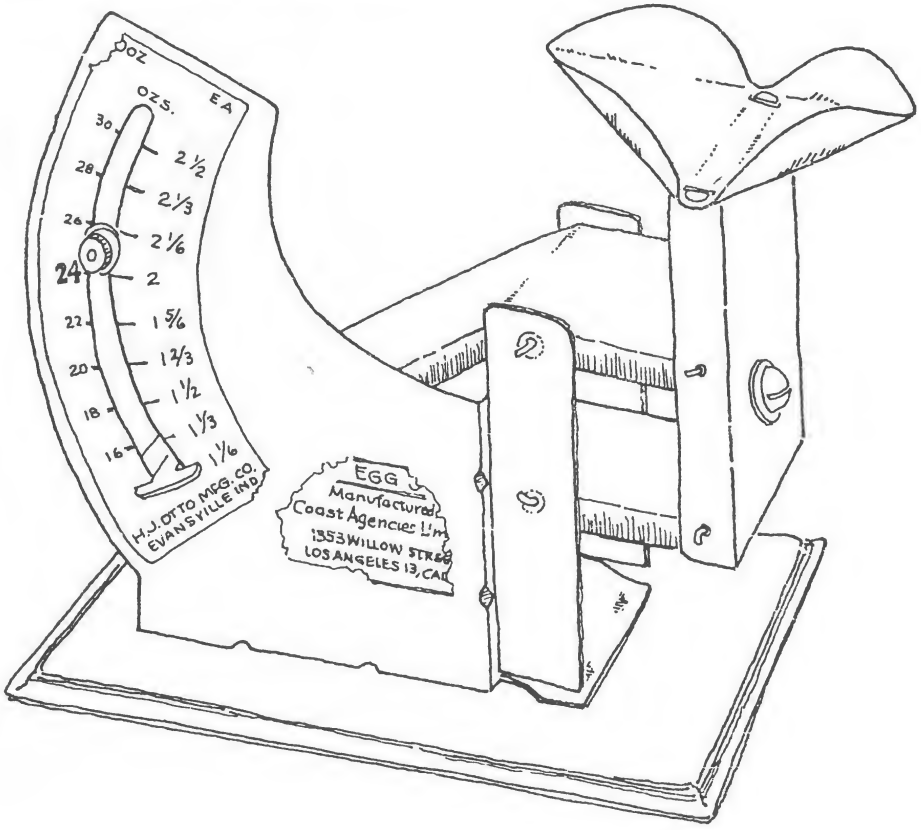


Fig. 16. H J Otto Mfg. Co. Evansville, Ind. Folded sheet, with bent nails as pivot bearings. Nut and bolt slotted through graduation arc so that the scale can be pre-set to pick out all eggs of above a certain weight, or all under a certain weight. Pendulum.

Candlers had a scale incorporated into a unit which was basically intended to look inside the eggs to ascertain whether they had been fertilised. The scale gave the user the opportunity to pick the eggs of a weight most likely to hatch successfully:- that was just over 2 oz but under 2 1/2 oz for most light breeds. The Gradencandler has already been mentioned under spring scales (Photo 4)

BY..Reliable Automatic using BE scale with long base to accomodate the lamp. If the egg breaks it will run onto the vertically mounted light bulb! (Fig 17.)

BZ..Shadolite, National Poultry Equipment Co. Seattle. The scale was the Magic (Fig 7) but the counterpoise was replaced with a bar. As the bar rose it allowed light to strike the frosted glass to show the grade. Once the candler was plugged in, the light remained on. There were two automotive-type bulbs with a transformer. The bulbs also threw light down on to the work area through a frosted blue pan. An oil filled damper prevented too many oscillations. Since the egg was held up to a vertical hole, a broken egg could not get into the working parts. (Fig 18).

As you will have observed, some companies altered the design of their scales through the years, retaining some features, rejecting some, improving others. Petaluma, Reliable, Zenith and Brower show extensive modifications, and make it difficult to write a fully comprehensive study of this subject. What other variations did their fertile minds think up? Why did they alter their manufacturing methods for such small improvements / alterations? Does anyone know the sequence of the designs, even within the companies?

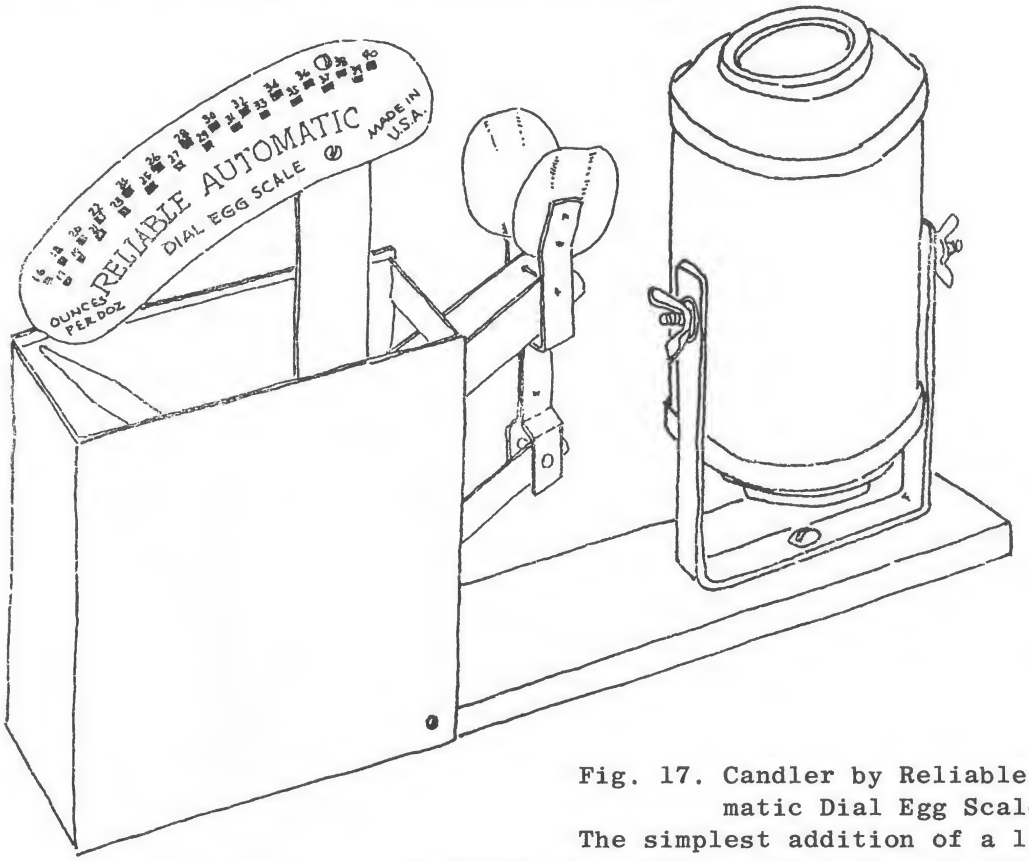


Fig. 17. Candler by Reliable Automatic Dial Egg Scale, USA. The simplest addition of a light mounted in a tube, so that the egg could be put on top of the tube and its fertility checked.

As the title infers, many of these contraptions could have been designed by Rube Goldberg, the American humorous illustrator. They were made of too many parts, of too many materials, and of too heavy components. They were difficult to use, to maintain and to repair. But their ingenuity, their variety and their naive charm make them most collectable.

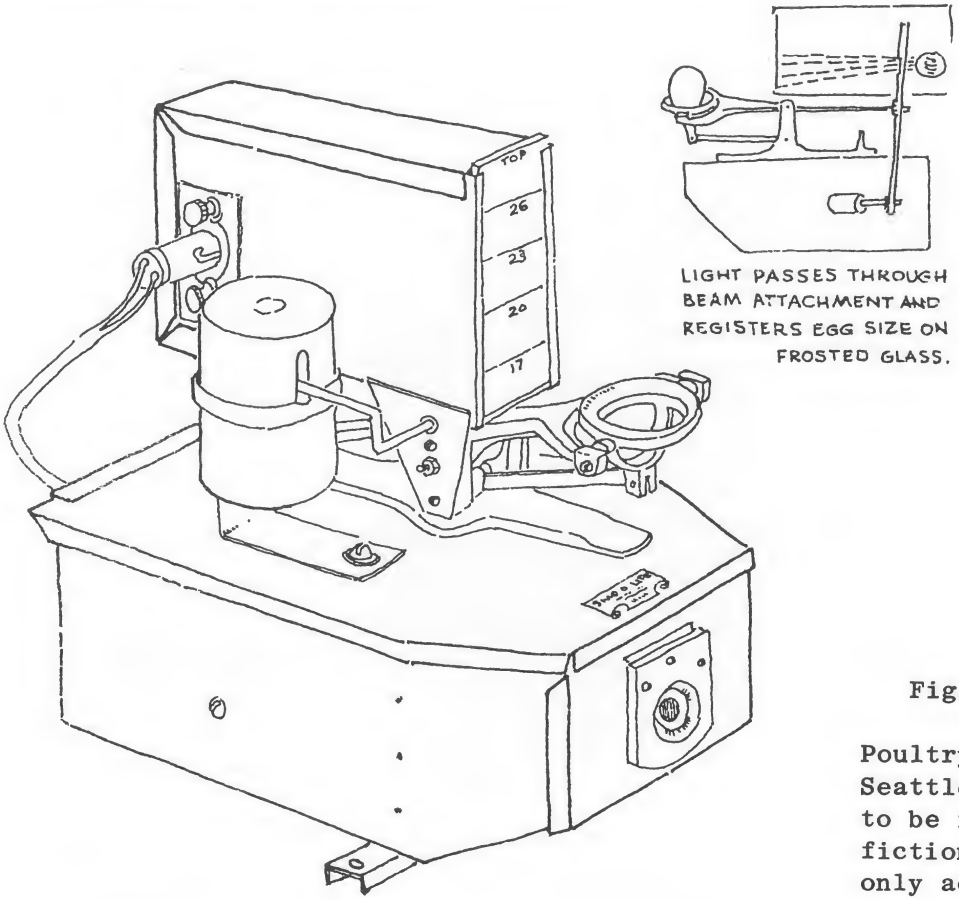
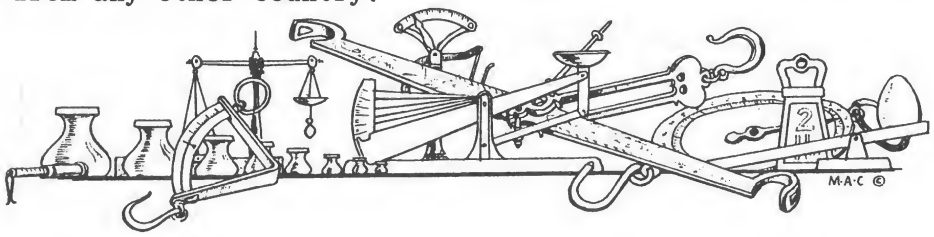


Fig. 18. Shadolite, National Poultry Equipment Co. Seattle, Fancy enough to to be in a space fiction film, but only achieving the same as fig. 17.

The author does not own all the scales discussed, but has ambitions to do so. He thanks his wife, Helen, and the Donigers for their help and encouragement. Additional evidence has been added by the editor, and any ambiguities or errors must be laid at her door. The illustrations are by Lou Costa and are copyright 1989.

The editor thanks Betty Wright, Gary Basch, Bill Doniger and Jerry Katz for the use of their photographs, and requests members to send any other egg scales details and photographs to Lou Costa, if American, or to the editor, if from any other country.



Restoration Workshop

by R Wells

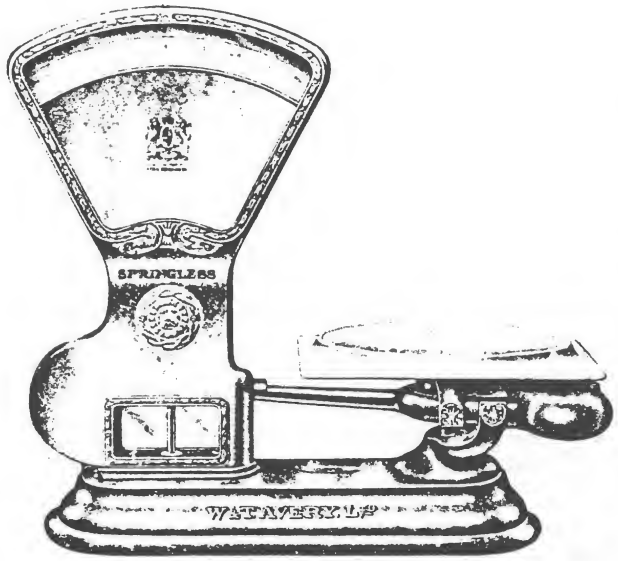
Transmission of Knowledge in Australia

I am one of those people who believe that the definition of a scale is "an instrument invented, designed, manufactured, distributed or sold for the accurate weighing of goods. When this instrument ceases to perform this function, it ceases to be a scale and becomes an ornament." When I say "a scale', I do mean a weighing instrument.

At the very first meeting of our Restoration Workshop, I took a brass beam scale and went into a fair bit of history and evolution of the scale. During this meeting I could sense a little boredom creeping in, but at the end of the meeting I produced an Avery fan scale in such a condition that I would have had to pay a junk man to take it away. I informed those attending the meeting that we would bring that scale back to its original appearance and condition, and how their eyes lit up! The scale had been featured in the 1915-1916 Avery catalogue, and when we finished it, everyone wanted to take it home! These same people now want to know everything about scales.

Our workshop now has a meeting at least once a month and sometimes we have had up to four meetings in one month, if something interesting comes up, and a few 'phone calls brings on a meeting.

Lately, a lot of our time has been taken up identifying and matching the paint, especially the gold paint which Avery's used on their scales in the early part of this century. We were fortunate enough to obtain the services



The "Avery" Patent Visible Weigher

The Avery catalogue for 1916 has this fan scale added at the back as an after-thought. They claim that the chief advantages are 1. Visible weighing, 2. Quicker weighing, 3. Prevention of mistakes in calculating total weight, 4. Customers pay for every ¼oz of goods, so fair and equitable trading, and 5. Customers are protected against unintentional underweight deliveries, due to 'catch' weighing and the retailer against the resulting suspicion and loss of trade. Spring scales were obviously a source of anxiety even in 1916, a hundred and fifty years after they were first used for scales, as the pendulum scale has SPRINGLESS in large letters where the customer would see it.

of an industrial chemist from the paint industry who did not mind our continual interuptions of his everyday working hours; he was able to come up with a gold copied from the inside of a scale casting which had never seen the light of day.

At present, we have achieved the art of reproducing transfers using 'skin', this skin being that which is used in the Burns Unit in hospitals, and it is also used to cover the wound when one tears one's flesh in an accident. I was able to save quite a number of the transfers that we used to apply to scales,

Weigh to build up a collection

ROY Wells has more scales than a fish.

He repairs modern weighing equipment and collects and restores old scales.

Roy has hundreds of scales, some 150 years old, at his Manning home and office. The latest is an old gold bullion scale given to him by the Commonwealth Bank to mend.

"I reckon the world would stop if there was no weighing equipment," he said this week.

"How could you build, design or measure anything?

"I've always been interested in ancient scales — I mend modern ones for a living — but I didn't think I'd end up with this many oldies."

Roy says the manual scale industry took a big step backwards when electronic equipment was introduced in the 70s.

"There's still no comparison," he said. "Sure, the digital ones eliminate human error but they are far from perfect.

"There is a lot of grand history in some of these scales, especially ones from the Victorian era.

"I doubt we'll see stuff like it again. That's why I want to preserve it."

He is one of the few Australian members of the International Society of Antique Scale Collectors. There are about 300 members world wide.

☐ Roy Wells — weight is no problem.

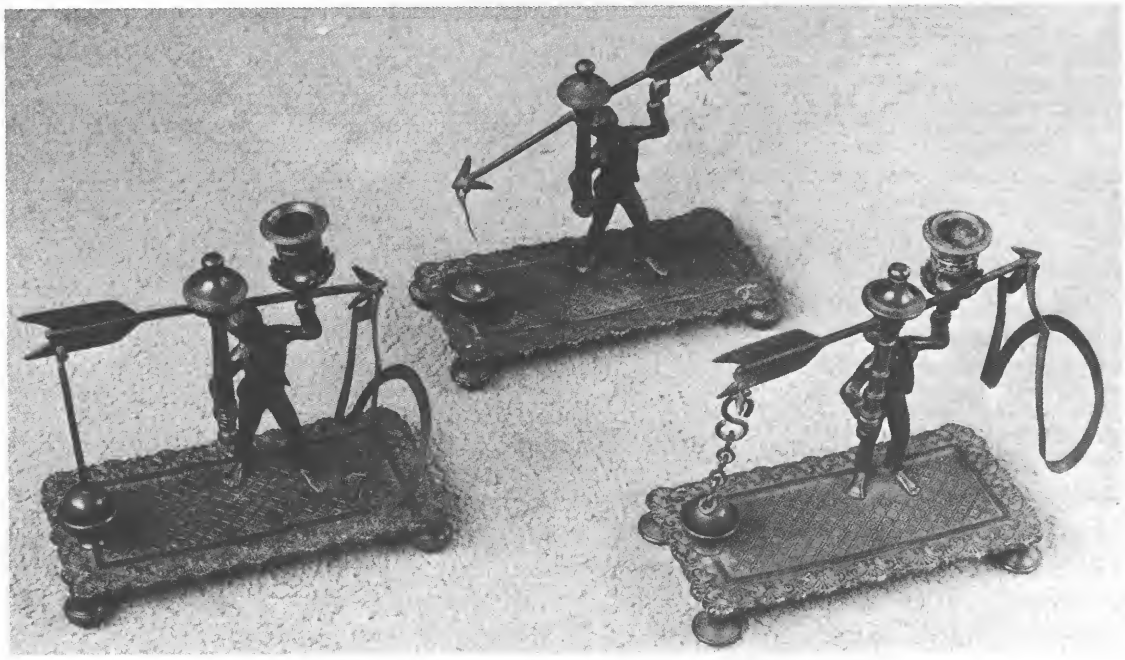
This photograph of Roy Wells, with a small part of his collection behind him, demonstrates the rewards of working on society's rejects. It is difficult to imagine these scales as rusty heaps, and, as Michael said in his lecture (EQM pages 1203-1210, 1234-1240 and 1265-1272) iron must be prevented from further deteriorating, and working parts must be made mobile again.

and I was able to recover quite a number through contacts formed in the scale industry over the past forty years. Once again we were fortunate enough to obtain the services of an artist to assist us in this regard.

We do not take a scale in immaculate condition, or even one with a few scratches on it, and strip it. All the scales we work on are rusted pieces of scrap which have been lying around for many years exposed to the elements. When we have completed the scales, we ask the Weights and Measures Department to test them for accuracy, but because Australia has been converted to the Metric System, the scales cannot be stamped. However the Department will give us a Certificate of Accuracy, for these scales, (some dating back nearly eighty years,) which can be taken to any country still using the Avoirdupois System, placed on a shop counter and used, as on the day they first came out of their manufacturers' box.

We have had many discussions at our meetings, regarding our bringing scales back to their original appearance and accuracy, and at every meeting it has been unanimously agreed that, while there is someone around to show and share the old skills of the weighing machine mechanic, then it is far better to pass on the knowledge before the skills are lost.

Editor's note: I publish this article with very mixed feelings. I agree with Roy Wells about the need to pass on knowledge, and his desire to restore very dilapidated scales. He emphasises that he works on scales less than eighty years old. Most of us in the Old World have scales of far greater age, and we have a responsibility not to leave our descendants misleading evidence of finish, material, methods of manufacture or replacement parts which have been guessed at. Additionally, old scales should look old, in my opinion, and not look as if they have just come out of their box (unless, of course, you are fortunate enough to have one which has just come out of its box!) "Maximum knowledge of the original scale" was Michael's motto with "Minimum intervention".



The scales on the right & at the rear are valid candidates for restoration.

How I Got Started

OVER THE GARDEN WALL

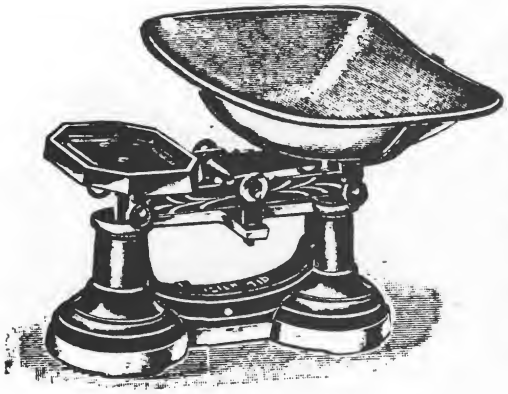
B GOODWIN

Have you ever cast a furtive glance at what your neighbour was throwing out, to see if it might be of some use to you?

One sunny day in 1980 we were minding our own business, just looking over the garden fence at the piles of junk that were accumulating on the new building site at the bottom of my brother-in law's garden.

Two hundred of the old 1940 prefabricated bungalows had just been demolished to make way for some new houses, and the contractors had invited the local residents to throw out their rubbish as the bulldozers were due the next day to bury everything and level the site.

There, amongst the bedsteads, old bicycle frames and general household paraphernalia was a very battered kitchen scale with a few brass weights.



Kitchen scale of the kind found in many British kitchens to this day, rugged and easy to hear when the goods pan drops with a full load, but frequently mucky round the bearings. Scavengers working on rubbish dumps come across such scales regularly, when they are searching for more ephemeral items such as rare coloured glass or tinware. Dealers sand-blast them and paint them then put on new brass pans to sell them as antiques or as working kitchen scales again.

After some discussion about the legality of taking things from a dump, the morality of removing someone else's possessions and the general grotty appearance of everything in sight, the wife was detailed to slip over the fence, grovel in the rubbish and retrieve the two pound weight while I kept a watch for moving lace curtains in bedroom windows!

It was agreed that the weight with a handle on top of it would look quite nice when polished up, but the flat round weights , and an earthenware pot with a handle, were returned to the heap as having little aesthetic value!

Three weeks later the weight was re-discovered in my shed and I spent an afternoon polishing it before it took its place on a shelf alongside a glass vase, a china jug and a candlestick. Having noticed some interesting markings on the base we decided that perhaps the other weights would complete the set and make an interesting talking point for visitors. So over the fence we went again, but, alas, by now the site was sprouting walls everywhere and all the interesting rubbish had gone, to be replaced by piles of bricks, assorted builders' huts, concrete mixers and dumper trucks.

Not to be thwarted, we began to take an interest in the local antique shop and before long a set of brass bell weights appeared in the window. They were a different shape from ours but at £12 for six, they seemed a bargain.

After we had bought them, another set appeared in the window, and then another. Yes, you have guessed it, we had found our very first repros! Can you imagine anyone buying three sets before realising that they had been done?

This was our first introduction to the "honest" trader - from then on we have viewed shops and dealers with varying degrees of suspicion but have still been caught again a couple of times!

(I must say that members of ISASC are above such suspicion!)

This was our collector's first lesson; if you see it - be careful, and if you are told that it is a bargain - be suspicious.

Fake nesting weights vary from the blatantly obvious rattly, chemically 'antiqued' green-finished, badly-made, wobbly-hinged, curved-sided tourist junk, to the sophisticated Nuremberg style fakes like this one. To the knowledgeable, the bronze is too yellow and has to be 19th or 20th century. The inspectors' marks are too near the straps and were obviously applied before the lid was assembled. The date marks, 1711, are too inaccurately applied, when the maker had the skill to make such a nice brass article. The clinching arguement though, comes when each cup is weighed. Although they fit inside each other perfectly, they fluctuate wildly from a descending set of units.

Revenge is sweet! The shop closed down about six months later, and by now we had learned a little more about originals and repros. The day before the closing-down auction we managed to pick up a set of real bell weights for only £20 (7lb down to loz,) because the auctioneers thought we were dealers!

So we had learned our second lesson;- be flexible;- the trade like other traders, some of the trade are sympathetic to sincere collectors- but the public prefers collectors!

By now we had started to notice the advertisements for antique fairs which appeared in the local newspapers. With great enthusiasm and some trepidation we went to our first fair in the little market town of Melton Mowbray. Innocents that we were, we even paid to go in!

Being rewarded with a few small weights, we were satisfied, but as soon as we discovered the advertising magazine Exchange and Mart, we began to plan our weekends around the fairs from Northampton to Chesterfield. We have travelled miles to large fairs in showgrounds and to small ones in school-rooms, and have frequently spent more than we ever intended!

On the credit side we have made friends of antiques' shop owners from Bath to Keighley, and with some mobile dealers!

Alas, we still get caught out! We have several sets of nesting weights that rattle too much, and a large iron weight with a wooden plug in the centre that is very suspicious! We know that there is a matching one of those 'weights' somewhere out there, so if you would like its mate, let me know!

I think it must have been at about 800 weights that we branched out into scales as well, and while at an antiques fair at Diss in Norfolk, we were introduced to two other collectors who were both members of ISASC. Very soon afterwards we became members ourselves, immediately bought all the past copies of EQM and met all the other interesting characters with kilos of scrap metal adorning their living-rooms!

The best part is that we can be sure of meeting friends at the Queen's Hall, Leeds, the Granby Halls, Leicester, Newark Showground, Bingley Hall and all the other fascinating spots in the country.

All this from peering over the garden wall!

Notes & Queries

NQ 109

note from G Zavattoni

I send a photograph, (Fig. 1) of a wooden box with a decoration reminding me of sailors' work, (scrimshaw,) with Shakespear's head at the bottom. Inside there is a scale beam with small pans and green cords which appear to be replacements. The weights are for the guinea, half-guinea and the 7s piece. The under-side of the lid has a sliding lid covering a grain-weight locker, now empty. The inner surface of the lid is engraved 'Shakespear's Wood- Sharp.'

Fig 1

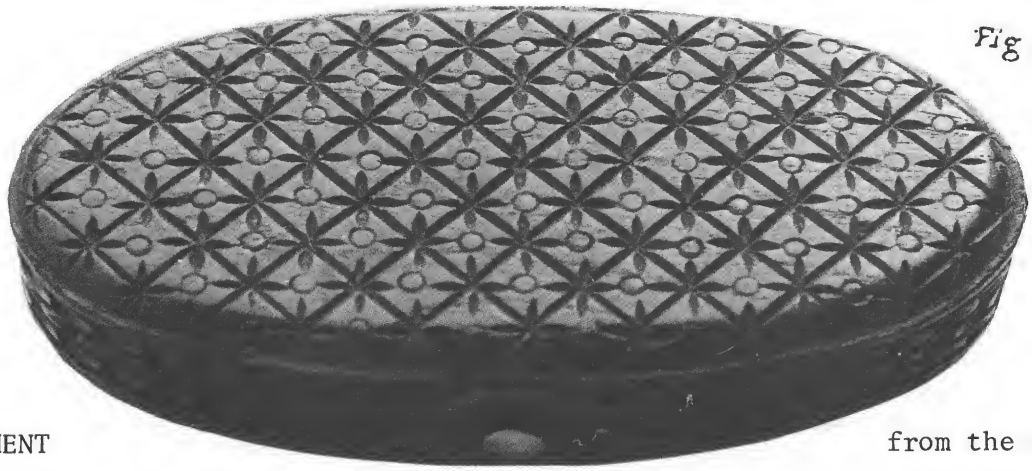
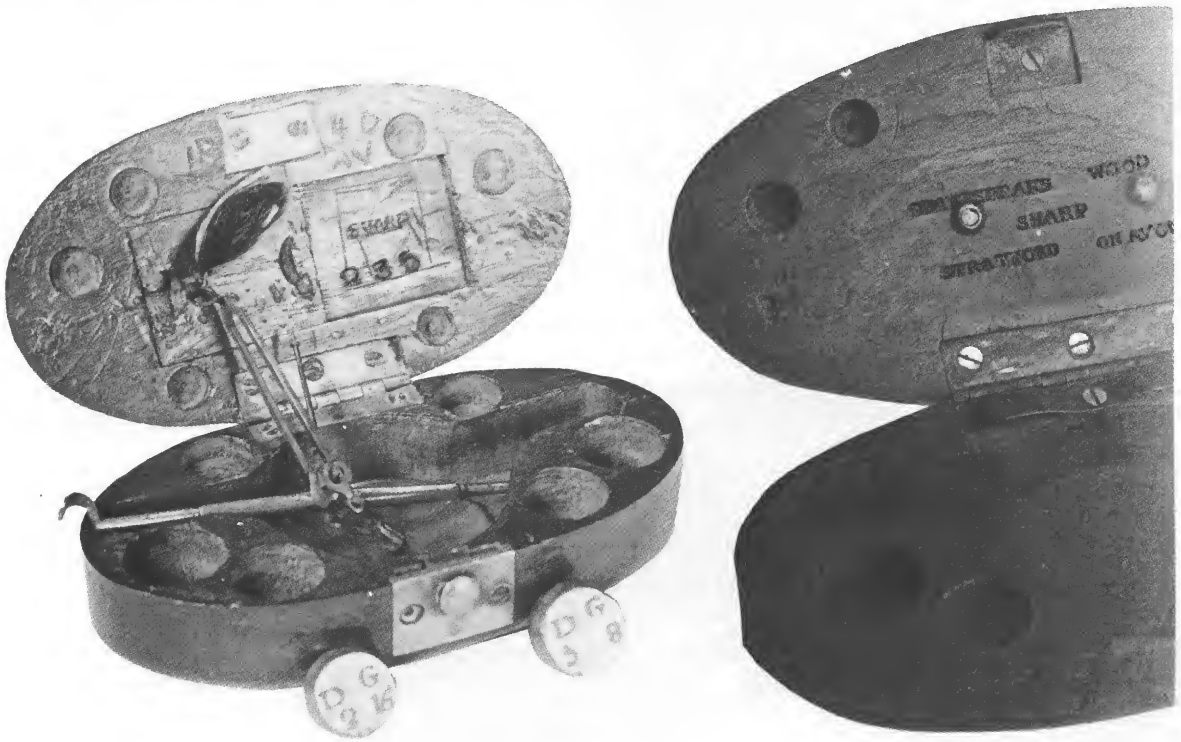


Fig 2.

COMMENT from the editor

I remember our excitement on first seeing a beautifully carved box (Fig. 2) made by Sharp of Stratford on Avon and clearly stamped (not engraved,) Shakespear's wood. In a book called 'In Honour of Shakespeare', Levi Fox states that the mulberry tree outside Shakespear's house in Stratford was cut down in 1756, and made into items such as goblets, caskets, snuff-boxes and tobacco-stoppers by Thomas Sharp. It is suspected that he used more than one mulberry tree, judging by the numbers of objects that have survived. He was still working after the 1774 Act of Parliament, when it became necessary to have extra guinea weights to check old light-weight guineas, so that coin scale boxes had at least two sets of guinea weights for the next few years. The pleasant curves of the oval box fit comfortably into the hand, and the high gloss of the close-grained wood is delightful to look at and to stroke. The combination of chip carving and stamping is superbly executed on the bottom of the box.



We were even more interested when we saw the Sharp in the Museum of the History of Science in Oxford, with its number 256 stamped into the wood. We assumed that it was a serial number used on scales only, but we have never been able to prove that the numbering was not also used on other items. We have since seen numbers 184, 698 and 235.

As with so many scale-makers of the period, Sharp included a weight for the quarter guinea. This must have been a rarely used weight, as the quarter guinea was minted for only one year, 1762, was hated for the ease with which it could be lost, and must have been a very uncommon coin by 1775. I can remember the excitement caused by a similarly tiny coin when I was a small girl;- when a farthing turned up in our change, we all gathered

round to look at it and admire the wren. The farthing was still legal tender, but it had not been minted for years and had become a fondly remembered curiosity. Did people in 1775 want to be reminded of their youth? Did they want to be ready, in case a quarter guinea turned up? Certainly the number of quarter guinea weights surviving give a totally misleading idea of the number of quarter guineas in circulation.

Pre-1700 England

SOME THOUGHTS ON PRE-1700 ENGLISH SCALES & WEIGHTS by D F Crawforth

Early civilisations have left little evidence as to how they struck a bargain in trade. Presumably they had norms:- a handful, a bucketful- but we cannot make any assertions as to how they settled an arguement.

The Romans were more systematic. Each man in the Roman army got his rations by weight, and when he left the army and settled down after his 25 years service, he would have been totally familiar with equal-arm balances, steel-yards and coin-scales. I do not intend to cover the Roman period, as it is impossible to say whether the Roman scales found here were made in England or imported. Suffice it to say, plenty of Roman scales have been found in England on domestic sites, military sites, trading areas, along roads and in rivers. It is difficult to date them, to state their use or to ascertain their accuracy, usually.

The Anglo-Saxons and the Vikings were great users of scales, having precise ideas of justice, fairness and trading practice. They left equal-arm balances steelyards and coin-scales as well- with one type coming up regularly on sites- the folding beam, made to fit into a box only one-third the length of the beam. Although they were invented during the Roman occupation (76 AD.-400 AD) they were much more widely used after about 600 AD. These neat little coin scales were superbly crafted, and could be justifiably confused with their 18th century counterparts. We cannot say with any confidence whether they were used from 800 AD continuously until the 18th century, or whether they were reinvented during the 18th century. Going on current evidence, I incline to the view that they were reinvented.

Although the Normans conquered England in 1066 AD, they seem to have had little influence on the artifacts used by their subjects. They brought in superb stone-masons, took out vigorous embroideries and introduced the rabbit. They put in new over-lords, but we haven't enough evidence to say whether they introduced the bismar, (Fig.1) Due to its continued use in all

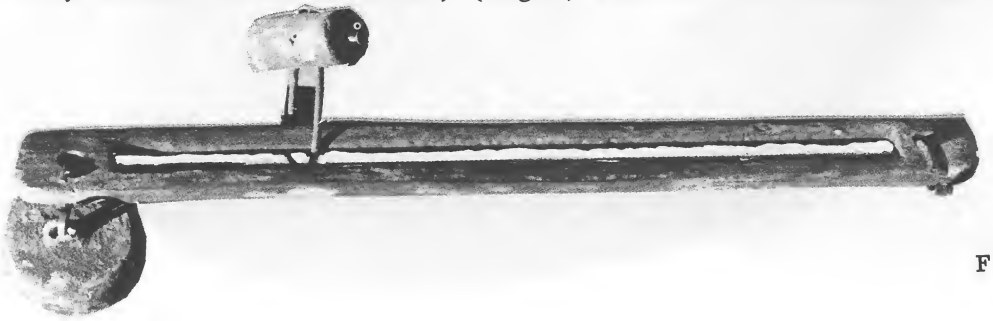


Fig. 1

the regions conquered by the Vikings, some credence must be given to the idea that either the Vikings or the Normans (who were only Vikings who had settled in Normandy in northern France two generations earlier,) brought bismars to England. It is difficult to explain why the bismar 'caught on' as it is the same size and weight as its equivalent steelyard, weighs the same sized load & is only differentiated by having diminishing distances between the graduations instead of equal distances. Of course it gives the trader much greater opportunities to cheat the customer. Maybe that is why it caught on in England, and why the English traders resisted the proclamation banning its use! Foreign traders coming to buy wool in England hated the bismar, (otherwise called a tron, auncel, pounder or scheft,) and also hated the custom by which an equal-arm beam was allowed to tip towards the load an unspecified amount. They complained to the King of the injustice of such systems, but the King's proclamation of 1352 failed to prevent the use of the bismar, and eventually the Chichelye family got organised;- two brothers being Masters of Grocers' Company (who checked scales and weights in the City of London,) one brother being a Member of Parliament and a fourth brother being the Archbishop of Canterbury (the Pope's representative in England.) The threat of excommunication by the Archbishop in 1428 was totally successful and the bismar disappeared from England.

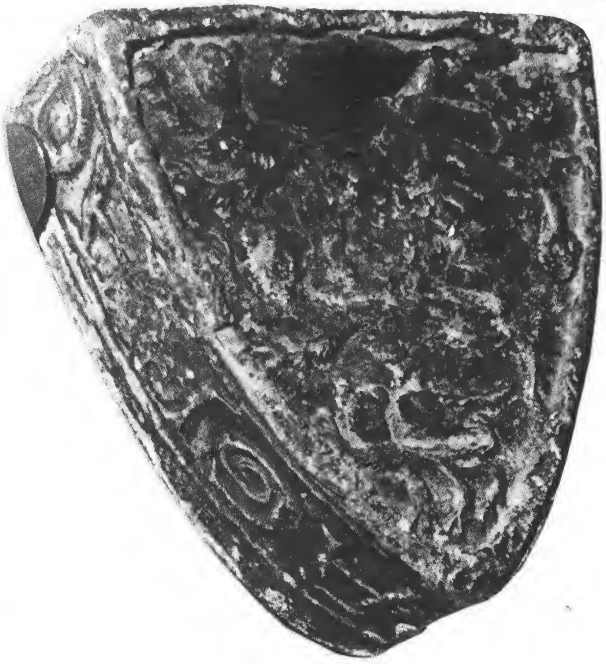


Fig. 2.

Those traders who came to buy wool had to be pacified. Any wool they exported carried a 33% tax, which was the main source of revenue for the Exchequer. (Wool that had been woven into cloth carried only a 2% tax, which was of little use to the Exchequer, even if it did provide much needed employment for the country people.) Obviously the Exchequer was exceedingly vigilant in guarding against the illegal export of wool. It was bonded in the same way as alcohol is today, and it was subjected to scrupulous weighing with special bismars, (trons,) on tripods before 1428 and after 1428 with equal-arm beams with special weights. Gradual refinement of the weight systems, with the smallest unit being either 6¼lb, 6½lb, 6¾lb or

7lb (as the sixteenth part of the 100lb, 104lb, 108lb or the 112lb hundred weight,) and a sack of wool to be 350lb or 364lb. The intricacies of the systems are admirably explained in R D Connor's book, and need no further words from me. He illustrates a wool weight, (Fig. 2) made of lead from the time of Edward I (1272-1307,) and shows the gradual rounding of the shape when wool weights were made of bronze,(Fig. 3) and the development of the shape by James I's time (1603-1625,) to a curved top and pointed bottom.

Fig.3.

Fig. 4.

Fig. 4.

The Norman culture allowed the use of the bismar, and tended to reserve the equal-arm balance for bullion, (if the surviving documents are to be taken as representative,) but they had plenty of steelyards in use, judging by the number of superb steelyard weights that have survived, (Fig. 4) As they commonly had the Arms of important men, for example, of Richard, Earl of Cornwall and Poitou, (1257-1272,) they must have been considered official steelyards. The ones that I have handled must have come from small steelyards of about 9-12 inches, (30 cms.) long, weighing goods below 1cwt. (about 50 kilos,) if used with iron steelyards, or perhaps half that, if used with wooden steelyards.

To be continued ➤

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EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

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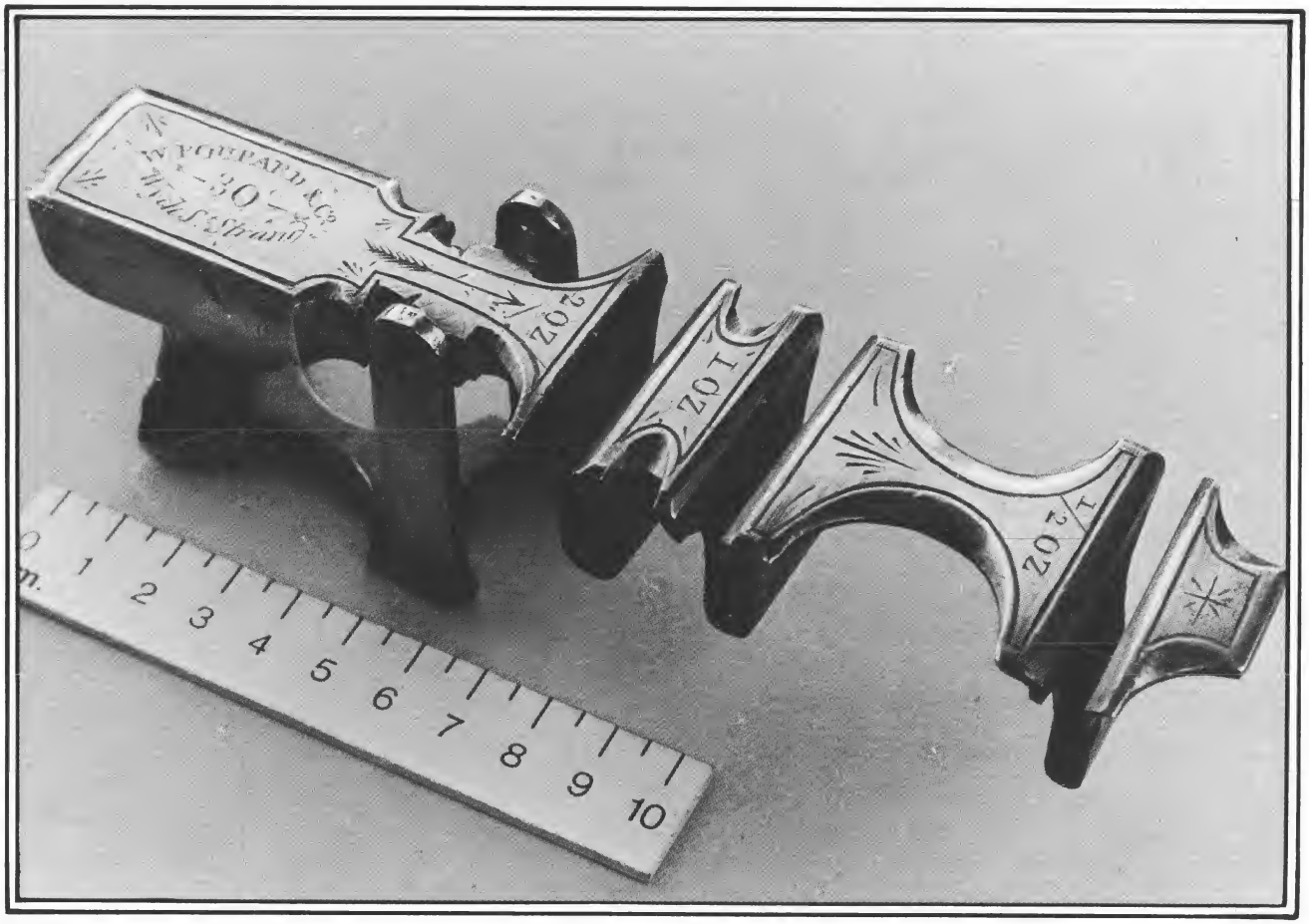
PAGES 1329-1356



PAGE 1330

Cover Picture

This rare letter balance was signed by W Poupard & Co. 30 Wych St. Strand. It was a rocker type and the letter was placed vertically in one of the slots, which was marked ½, 1, or 2 oz. The brass beam was cast in one piece and dressed to the finished shape and balance. Brass knife edges pivot in brass bearings.

It must have given very approximate results, not only because of the brass knives and bearings, but also because a thin letter would tilt in the slot. If the letter tilted towards the fulcrum the balance indicated a light weight. If the letter tilted away from the fulcrum a heavier weight was indicated.

The inclusion of the ½oz. denomination indicates that the scale was made between 1840 and 1871, but we do not know when W Poupard & Co. worked. The Poupard clan were deeply involved in scale-making from 1838 onwards, as we know from trade directories, but their relationships are obscure.

POUPARD CLAN: (all lived in London.)

Charles P, 39 Brown's Lane, Brick Lane,.....1838-1853
E Poupard Junior, 44 High St, Bloomsbury.....on apoth scales
Edward Edwin P 44 High St, Bloomsbury.....1839-1848
74 Red Lion St, High Holborn.
Frederick A Poupard & Co, Coldharbour Lane & Barrington Rd,.....1883-1885
Clyston Wks, Wandsworth, SW.....1905
Mrs Sophia Sarah M P, 5 Kings Place, Commercial Rd East,.....1854-1855
8 Kings Place, Commercial Rd East.....1860
Thomas James P, 148 Tooley St, SE.....1883
134 Tooley St, SE.....1895
17-21 Wenlock Rd,..... 1974 onwards >

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Editor— Diana Crawforth

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Oxford OX5 1NE England

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>POUPARD CLAN continued

William P, 23 Ship Yard, Temple Bar.....1839-1873
30 Wych St, Strand.....1841-1858
257 Blackfriars Rd, S,.....1860
7 Blackfriars Rd, SE.....1869
W Poupard & Co, 30 Wych St, Strand.....
W Poupard & Son, 7 Blackfriars Rd & Collingwood St.....1881
7 Blackfriars Rd.....1910
William Poupard & Sons, 7 Blackfriars Rd, SE.....1865
7 Blackfriars Rd & Collingwood St, SE....1875-1895
7 Blackfriars Rd & Salutation Place SE.....1905
Kings Rd, Brentford.....1913

Notes & Queries

NQ 110 — Query from M Woodward

I need to date a ship-wreck we found off the South coast of England, so that we can decide whether to do an underwater archaeological dig. Ten lead weights have been brought to the surface, with very worn marks, which might help with dating. The dagger of the Guildhall, London is deeply indented, but I can't identify the big blobs on the 15 oz. weight.

Reply — from the editor

These bun shaped weights were the traditional shape of trade weights used during the 17th century, before iron and brass weights superceded lead weights. As they were made of lead, the Plumbers' Company had to check that they were full weight and stamp their St. Michael and Scales on the top surface. The blob at the top left was originally an angel and scales. The Plumbers' Co. also stamped on their Monarch's mark, in this case a large crowned C, as one of the Charles was on the throne, at the top right. The great size of the marks was due to the softness of the lead. When brass weights were being stamped by the Founders' Company, a much smaller stamp was used, as brass took a much crisper mark. It is impossible to state which Charles was on the throne, either Charles I, 1604-1616 or Charles II 1659-1689. As the other artifacts brought up were made in the late 1600s, I would judge that the ten weights are consistent with that date, but please don't do a dig solely on such nebulous evidence.

A Talent of St. Mary

by L HOLLAND

Sdot-Yam is a kibbutz, or collective village, on Israel's Mediterranean shore. It is home to about five hundred people. Its members, all equal partners in the collective, make their living from farming and light industry. They have a boat-yard and a tile factory.

The white-washed, red-roofed bungalows and the handsome communal buildings of the kibbutz stand in a setting of rolling lawns, flowering gardens and luxuriant shade trees. On the seaward side, there is a sheltered, sandy cove. A splendid boat-house on the beach serves the favorite pastime of many of the members, (two of them won the World Sailing Championship in one of the small boat classes, a few years ago.)

By any standards, this is a lovely place. But Sdot-Yam has an additional feature; it is built squarely on the site of an ancient city.

The name of the city was Caesarea Maritima, (or Caesarea-in-Samaria.) It was built by Herod I, King of Judea, in the last years of the 1st century BC, and named by him after his friend and patron, Augustus Caesar [1]. Herod had a compulsion to build extravagantly, and at Caesarea he gave it free rein. The harbour, Limen Sebastos, was one of the largest in the world. An aqueduct brought drinking water to the city from springs 14 km. away, (it functioned for many hundreds of years; much of it still stands.) Exotic building materials, (white marble from Italy, red granite from Upper Egypt,) were brought in huge quantities for the embellishment of the city. Colonnaded streets, temples, public squares, a theatre, an amphitheatre, a hippodrome;- everything possible was done to make Caesarea the pride of Judea and a worthy monument to its Imperial eponym.

Beth-She'an from atop the Acropolis or 'High City' looking down on the city centre, & in the right background the theatre.

Caesarea prospered greatly. When Judea lost her independence and became a part of the Roman province of Syria Palastina, Caesarea became the provincial capital. Its population in Roman times may have numbered as many as 100,000. It played an important part in early Christian history;- the first Roman convert, Cornelius the centurion, was baptized there by St. Paul; and St. Paul spent some time in jail there. In the 7th century AD, Caesarea fell to the conquering Arabs; and in 1101, it was taken by the armies of the First Crusade. It remained a part of the Crusader Kingdom of Jerusalem until 1265, when it was sacked and destroyed by the Mamluk Sultan Rukn-ed-Din Baybars. It was never rebuilt.

In 1938 a group of Jewish pioneers settled at Caesarea, on land purchased for them by the Jewish National Fund. They built their homes alongside the ruins of the theatre, some 800 metres south of the harbour and the Crusader walls. It was an archaeologist's paradise. Bits of masonry, statuary, pottery glassware, and mosaic lay everywhere. Every spadeful of earth they turned up contained half-a-dozen ancient coins and other artifacts. They could not begin digging a ditch, or clearing a patch of ground for building, without uncovering another Byzantine chapel, Roman bath-house, or temple of Mithras.

In the last fifty years much has happened at Caesarea. The waterfront and city centre have been extensively excavated and, with the Crusader fortifications, have become a popular tourist attraction. The theatre has been dug out and restored; in the summer season, one can sit and watch a play or a concert, against a backdrop of the moonlit Mediterranean-- an unforgettable experience. Excavation continues, with archaeologists and students from all over the world coming to take part. A specialist group has been using underwater techniques to explore the ancient harbour works [2]. The kibbutz members themselves, fully appreciating the treasures among which they live, have built a fine museum to house the thousands of ancient objects which the building of their homes has brought to light. Further afield, the countryside for miles around Caesarea has attracted numerous amateurs, who for many years used to wander the ploughed fields, orchards and sand-dunes in search of surface finds-- coins, gems, weights and other small artifacts. This unofficial activity resulted in the recovery of great numbers of small objects which would otherwise have been lost [3]. Many of these are weights and weight-like objects, and therefore of special interest to us. They span the whole history of Caesarea, a period of thirteen centuries.

I have been lucky enough to obtain access to several private collections and examine their contents. The ancient coin-scale described in an earlier article (EQM page 814) came from Caesarea, as did the mediaeval Arabic coin-weights illustrated with it. These small weights have turned up at Caesarea in hundreds [4]. Many hundreds of Roman and Hellenistic weights have also been found at Caesarea. I hope in future articles to be able to tell readers of EQM about these ancient weights.

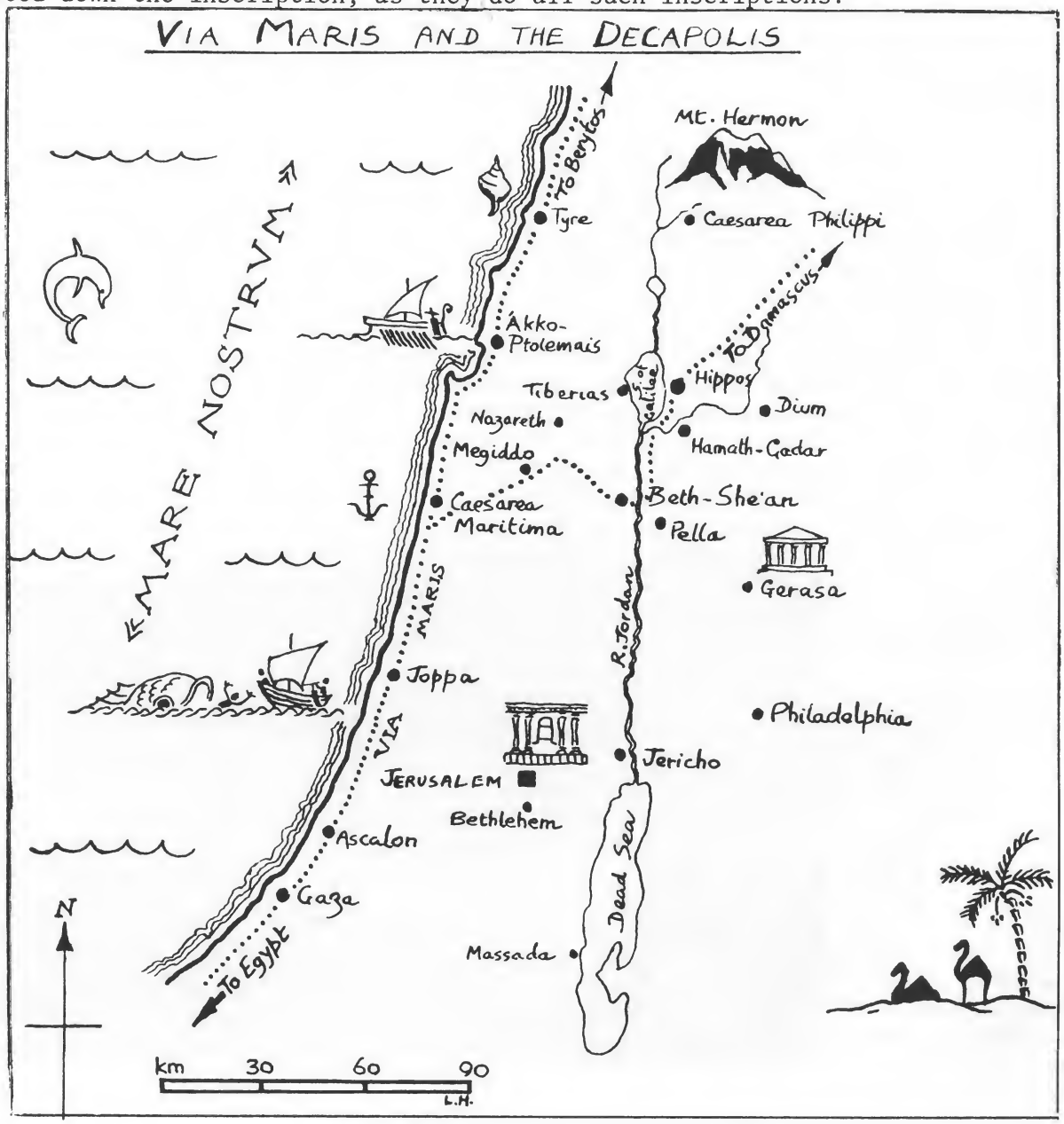
Living on top of an archaeological treasure is not without its drawbacks. Hawk-eyed inspectors of the Israel government's Department of Antiquities watch the Kibbutz members' every move, ready to call an immediate halt to any activity which might in any way jeopardize the national heritage, and carefully noting down, numbering and indexing every bit of broken statuary or piece of carved masonry which the farmers' work brings to light.

Which brings me at last to the subject of my story. I was going one day to visit Aharon Wegman, the kibbutz museum curator, when something among the litter of broken columns and decorated capitals beside the path caught my eye. I stopped for a closer look.

It was a large block of marble, originally rectangular, but somewhat the worse for wear. One face was carved in Greek, the following inscription:-

ΤΑΛΑΝΤΟΝ
ΤΗCΑΓΙΑCΜΑΡΙΑC which means 'A Talent of Saint Mary.'

I drew Aharon's attention to the stone, and asked, 'Had anybody else seen it?' 'Yes the archaeologists of the Department of Antiquities had seen it, and noted down the inscription, as they do all such inscriptions.'



'Had anyone mentioned anything about its being a weight?'
'No.'
So much for the professional archaeologists.

I measured the stone. The original dimensions would have been 45x28x24 cm. After measuring the broken edges as carefully as possible, I estimated that the stone had lost about 10% of its original volume. Weighing the stone was a rather makeshift business, using a bathroom scales which I brought to the spot. It gave a figure of 63 kg, (accurate by my reckoning to within about $\pm$ 1 kg.) When intact, therefore, the stone probably weighed about 68-70 kg.

This still leaves the question;- What is it?

'Talent' is the name of the largest unit of mass in the ancient Greek weight system;- 100 DRACHMS= 1 MINA (or MNA)

60 MINAS= 1 TALENT

This basic system was used throughout the ancient Hellenistic world. The absolute mass of the units varied from one place to another; and even in one place, they might vary from time to time, (there is nothing simple about ancient weight- systems, they are just as complicated and confusing as those of pre-metric Europe; sometimes more so.) A typical example is the Attic standard, which was used in and around Athens. The Attic drachm weighed about 4.36 g. the mina 436 g. and the talent 26.2 kg. This was the standard for precious metals and coinage. In the 6th century BC, the Athenian law-giver Solon introduced a separate standard for merchandise, with units 5% heavier than the coinage standard. The talent of this standard weighed 27.5 kg. During the succeeding four centuries this commercial standard was officially altered at least twice, the mass of the talent becoming successively 36.1 and 39.2 kg.[5].

Other Greek weight systems were similar in pattern. This is because all of them were ultimately modelled on a very much more ancient system— the

Sumerian---which originated in Mesopotamia, 'the Land between the Rivers.' The Sumerians occupied the Southern part of Mesopotamia, at the head of the Persian (or Arabian, depending upon whom you are talking to,) Gulf. They had a thriving agrarian civilisation going, (based on city-states such as Ur and Lagash,) by 3000 BC, at which time they invented cuneiform writing and began to record their history.[6].

Astronomy played an important part in the Sumerian religion, and they were much occupied with mathematics and calculations. They used a sexagesimal system of numbers, based on multiples of 6 and 60, (it was the Sumerians who gave us the 360 degree circle.) Their weight system was:-

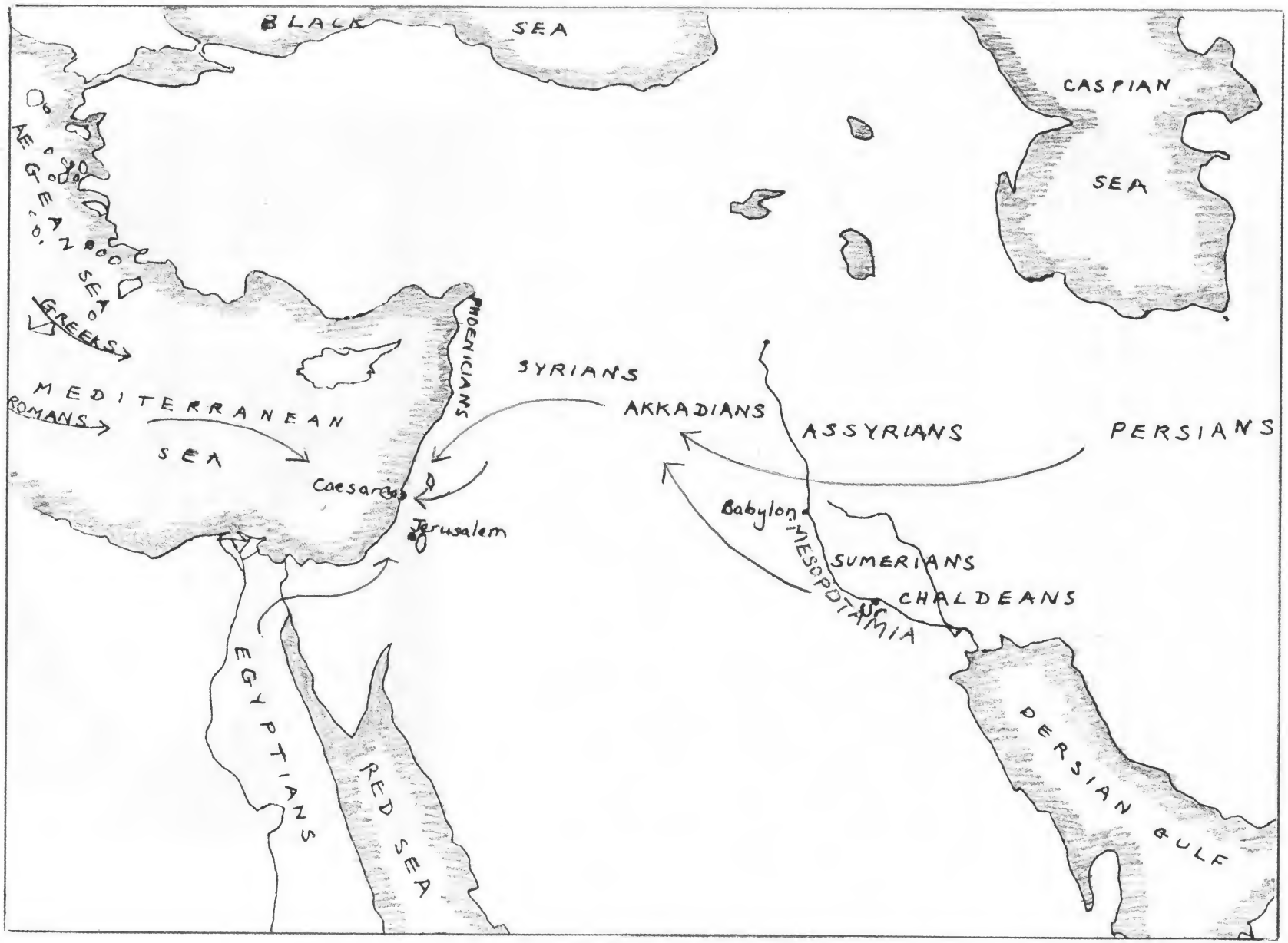
60 SHEKELS = 1 MINA (or MANA)
60 MINAS = I TALENT

The Sumerian shekel weighed about 8.36 g, the mina 502 g and the talent just over 30 kg. 'Shekel' and 'mina' are not the names given by the Sumerians to their weight units. They were of Semitic origin. The Sumerians were not a Semitic people, but some of the nations who came after them were. When Sumerian power declined, the Akkadians,(a Semitic people,) assumed hegemony over Mesopotamia. Later came the Babylonians, the Assyrians,(another Semitic people,) and the Chaldeans. All these nations adopted the Sumerian weight system,(and many other attributes of Sumerian culture,) with very little change.

The word 'shekel' derives from the Semitic root (SH)-Q-L, which is associated with the concept of weight and weighing,(cf. the latin 'pondus', the Spanish 'peso', the Arabic 'mithqal'-- this last, deriving from the same root as 'shekel'.) 'Mana' means 'a portion'. In Hebrew, (also a Semitic language,) the word for a talent is 'Kikar', meaning a round object, (it can also mean a loaf of bread.) This is probably connected with ancient metallurgical practice. In Bronze Age Near Eastern copper-smelting furnaces, the molten metal ran down into a circular depression in the earth beneath the furnace, solidifying into a round, loaf-shaped ingot;- 'Kikar'.

The militaristic Empire-builders,(Assyrians, Chaldeans, Persians,) who rampaged all over the ancient Middle East, carried a lot of Mesopotamian cultural baggage with them, and left some of it wherever they went. Consequently, many Middle Eastern nations ended up with weight systems recognizably related to the Sumerian. The Greeks, who were settled all over the Western Asian coast and the Aegean Islands, as well as the Greek mainland, naturally enough, took the same model.

By the beginning of the Christian era and the Roman Imperial period, there were in use all over the Near East and the Eastern Mediterranian, dozens- possibly hundreds-- of local weight systems on the Sumerian pattern, each with its own shekel, (or didrachm or stater,) mina and talent. Some nations, leaning more to the decimal than duodecimal numeration, adopted a mina of 50 rather than 60 shekels, (though a talent was always 60 minas.) Such were the kingdoms of Israel and Judah, and also eventually most of the Greeks. Sometimes the units would be doubled, to give a so-called 'Royal" mana or talent,respectively, having exactly twice the mass of the regular units, (the precise function of these Royal units is not clearly understood today.)



CULTURAL ORIGINS

Most of the information we have today about ancient weight systems is about monetary systems, used for weighing gold and silver. We get it from weighing ancient coins, (which began to be minted about 700 BC.) However, as we saw in the case of the Attic system, monetary weights may be quite different from the commercial weights used for merchandise. Few ancient communities have been as thoroughly studied, and their remains so extensively excavated, as Athens,;- yet even from Athens, the data we have are very scanty indeed. The most reliable source of information is the surviving weights themselves. These, being mostly of lead or bronze in later antiquity,(from about the 7th century BC onwards,) are usually more or less corroded. The information they yield is not very precise.[7].

Having surveyed the historical background, it is time for us to get back to the 'Talent of St. Mary'. The cross and the inscription tell us that it belongs to the Christian era. The style of lettering suggests the 2nd century or later. It is also pretty safe to assume that the weight was in use at Caesarea itself, and did not somehow arrive there from somewhere else, (weights, unlike coins, rarely travelled far from their place of origin.) The talent referred to would most probably be one that was in use in 2nd century Palestine. Unfortunately for us, there were a lot of these, some deriving from Mesopotamia, others from Egypt, (the latter were quite different from Mesopotamian systems and have not been discussed here.) In Gaza, for instance, about 130 km. south of Caesarea, there were in use several systems, none of them very clearly defined; one of them was based on a drachm of about 3½ grams, ie. a talent of something over 20 kg. This is quite close to the Phoenician standard for silver coinage, which was spread all over the Middle East as a result of being used for the silver coinage of Alexander the Great and some of his successors. Many Hellenistic weights on this standard are found at Caesarea; the whole coast of Palestine was under strong Phoenician commercial influence. A commercial, as distinct from coinage, standard in use in Phoenicia or Syria at this time, had a mina of about 500 g, ie. a talent of about 30 kg.

None of these units seems quite to meet the requirements of 'A Talent of St. Mary', even if we double them. And even if we were to find an appropriate system to fit this talent into, many questions would still remain. Why should St. Mary require a talent like this? What would it be used for, and by whom?

Like so many other surviving fragments of the ancient world, this 'Talent of St. Mary' remains, for the moment, shrouded in mystery. One of my reasons for writing this article is the hope that among the readers of EQM there may be someone who can throw light on the subject. Please write to the editor, or to me, if you are able to do so.

NOTES

1....Caesarea Maritima is not to be confused with Caesarea Philippi, also mentioned in the New Testament, (Matthew 16.17, Mark 8.27.) The latter was built by the Tetrarch Herod Philip, (son of Herod I,) at Paneas, one of the sources of the Jordan, at the foot of Mt. Hermon. Other ancient towns named after the Emperor Augustus were Caesarea Mazacha, (Kayeri, Turkey,) and Caesarea Augusta, (Zaragoza, Spain.)

2....See the National Geographic Magazine, (February 1987, pages 261-279,) for an article by Dr. Robert Hohlfelder about the harbour of Caesarea. The illustrations are superb.

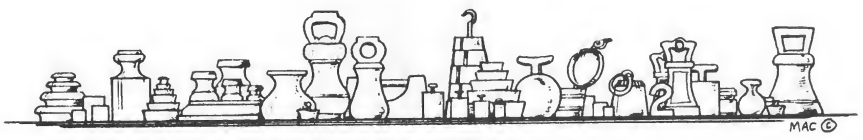
3....In 1978 the law put an end to such activities. Anyone continuing with it today is liable to arrest and prosecution.

4....For a detailed study of 600 such weights, see:- Holland, L. 'Islamic Bronze Weights from Caesarea Maritima,' American Numismatic Society Museum Notes, 31, (1986,) pages 171-201, plates 33-36.

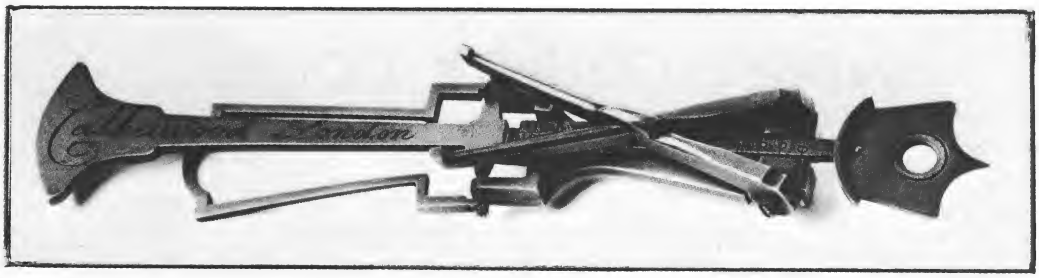
5.... 'THE ATHENIAN AGORA';- Results of excavations conducted by the American School of Classical Studies at Athens. Volume X; Weights, Measures and Tokens. By Mabel Lang and Margaret Crosby. Princeton, New Jersey, 1964.

6....For a brief, and wonderfully readable, account of Mesopotamian history and culture, I recommend 'Ancient Iraq," by Georges Roux, (Pelican Books, A828.)

7....Do not take statements such as 'The light Babylonian weight-talent had a mass of 29470.50 g.' (this one is from the pen of a respected early 20th century 'authority,') at their face value. Works on ancient metrology are full of such misleading stuff. Any quantitative statement by any writer on ancient metrology, (including the present one,) should be regarded with deepest suspicion unless adequate experimental verification is offered.



Notes & Queries



NQ 111 Query from G Zavattoni

I have a sort of rocker made by Catherwood of London. It was to weigh a ducat on the crown-shaped coin platter, with graduations on the beam of 1 to 11, over which slid a 'lid' inscribed $\frac{1}{100}$ DUC. It folded up to go into a case. I would like to invite members comments thereon.

The editor turned a nasty shade of green on seeing this superlative scale, and is now very keen to know when Catherwood was working, what else he made;- (perhaps scientific instruments?)- why he made a scale to weigh one coin only, which ducat of which country he made it for, and whether any more scales made by him have survived.

Wandering Weights

by J KNIGHTS

In the nineteen sixties, as a callow youth, I went to work for the Weights and Measures Department of Lindsey County Council. Lindsey was the northern third of the County of Lincolnshire, about 140 miles north of London, on the east coast of England.

Lindsey, (one of the antediluvian authorities washed away in the 1974 re-organisation, along with Rutland, Huntingdonshire and the detached parts of Flint,) was a large rural area, and, in common with similar authorities, the department operated a system of what were known as 'Stamping Stations.'

This was a procedure whereby an inspector from the authority, along with certain ancillary staff, would set up shop for the day in pre-arranged venues, in the county, to which traders were invited to submit their weights and measures for testing, and, where necessary, for adjustment and restamping.

The inspector and his assistants would arrive at the village hall, or other rural meeting place, on the day previously notified, towing behind his car a large black, covered trailer of sombre, even funereal aspect. When this melancholy conveyance had been manoeuvred up to the door of the hall, there was disgorged from within the equipment. This consisted of assorted brass beam-scales packed in wooden travelling cases, bronze weights snugly nested in individual holes in solid cubes of wood, again in travelling cases, steel punches and chisels, an oxy-acetylene welder and copious quantities of lead.

LINDSEY COUNTY COUNCIL

WEIGHTS AND MEASURES ACT, 1963

NOTICE IS HEREBY GIVEN that the LINDSEY COUNTY COUNCIL have made the following fixtures for the verification of

Weights, Measures & Weighing Instruments

and that an Inspector under the said Acts will attend at the undermentioned places on the dates specified

Note—Traders may submit their Weighing Equipment to any place mentioned in this notice.

Places at which Inspector will attend	1965				Attendance from 10 a.m. to 12.45 p.m. and 1.30 to 3 p.m.
STALLINGBOROUGH Methodist Schoolroom	Monday, Tuesday,	25th 26th	October October	....	Stallingborough Healing and Great Coates
IMMINGHAM Church Mission	Wednesday,	27th	October	.....	Immingham, Habrough and South Killingholme
EAST HALTON British Legion Hall	Monday,	1st	November	.....	East Halton and North Killingholme
KEELBY Yarborough Road Methodist Schoolroom	Tuesday,	2nd	November	.....	Keelby, Brocklesby and Limber
CAISTOR Central Methodist School-room, Chapel Street	Monday, Tuesday,	8th 9th	November November	....	Caistor, Nettleton and Rothwell Caistor, Croxby, Cuxwold, Thoresway, Cabourne and Swallow
LUDFORD Hut in Vicarage Grounds	Wednesday,	10th	November	.....	Ludford, Sixhills and East Wykeham
BINBROOK Queen's Hall	Thursday,	11th	November	.....	Binbrook, Thorganby, Kirmond, Swinhope and Orford
TEALBY Memorial Hall	Monday,	15th	November	.....	Tealby, North Willingham, Stainton-le-Vale and Walesby
KIRKBY-CUM-OSGODBY Village Hall	Wednesday, Thursday,	17th 18th	November November	....	Kirkby-cum-Osgodby, Claxby and West Rasen Usselby, Kingerby, Normanby-le-Wold, North and South Owersby and Thornton-le-Moor
MARKET RASEN Liberal Club	Monday, Wednesday,	22nd 24th	November November	....	Market Rasen Middle Rasen and Linwood
FALDINGWORTH Memorial Hall	Thursday,	25th	November	.....	Faldingworth, Friesthorpe, Toft Newton, and Buslingthorpe
LISSINGTON Village Hall	Monday, Wednesday,	29th 1st	November December	....	Lissington, Bleasby, Collow, Legsby and Snelland Wickenby, Holton Beckering, Reasby and Stainton
EAST BARKWITH Y.M.C.A. Hut	Thursday,	2nd	December	.....	East and West Barkwith, East and West Torrington, Panton and Sotby

All fees to be paid at the time of verification

All Weights, Measures and Weighing Instruments submitted for verification **MUST BE CLEAN**

Weights & Measures Dept.
Town Hall, Louth
Tel. No. 363

R. SAINSBURY
Chief Inspector

Boston, Lincolnshire, had inspectors who used this mark during the nineteenth century.

This one ounce weight was verified in the northern part of Lincolnshire, in Lindsey.

Inspectors in Lindsey also had the responsibility of checking liquid measures, such as this pewter one pint mug.

When the equipment was assembled and the doors opened for business, the local agriculturalists began to arrive by tractor, landrover and Mercedes, bearing with them large numbers of mainly 56 lb. weights, which were manhandled into the hall for the ritual check. Those weights found wanting in the balance were passed over for rectification. The inspector, because of his office, was prohibited from engaging in the adjustment of equipment, so the task of adjustment fell to an assistant.[1]. I found the role of 'adjuster' quite a satisfying one. At that age, to be an 'adjuster' of weights was redolent of one of those curious mediaeval offices such as 'assizer', 'sealing officer', 'examiner', etc. The other, less impressionable, if not downright cynical, assist ants were quite happy to let me fulfil the role; at which, I have to say, I have become adept.

Trade weights in the United Kingdom were (and still are,) adjusted by means of a plug of lead in an undercut hole in the base of the weight. When a weight was found to be light, therefore, it was necessary to add the requisite amount of lead to that already in the hole. This usually necessitated scraping clean the dirty surfaces of the plug and fusing new lead to the clean surface with an oxy-acetylene flame. The lead was then flattened with a punch so that the inspector could apply a fresh stamp to the surface. The result of this practice was, of course, the complete obliteration of any stamp or date that had previously been on the plug. This contrasted with certain items, such as measures made of pewter, (which melts into a distressed puddle if an oxy-acetylene torch is put anywhere near it,) or other metal, where one often finds stamps and dates applied serially and non-destructively around the top of the measure.

Bottom of weight, showing the hole left in the centre filled with lead and neatly punched by the inspector.

From these marks on measures, much can be gleaned about the stamping practices of the nineteenth century. It is seen, for instance, that measures were often retested at regular intervals, and a new date applied, as evidence of the inspection. One also finds, on occasion, that restamping has occurred without evidence of previous rejection. In particular, there is evidence that,, towards the turn of the century, stamps of the new uniform design were applied to measures previously marked with the older forms of local stamp. Certain measures display evidence of curious migrations from one part of the country to another. A much travelled example of my own is a somewhat battered pewter half-pint measure with marks that speak of time served in London, Sheffield and various parts of Nottinghamshire between 1890 and 1908. Doubtless, others have pieces of equipment that tell of even more elaborate perigrinations.

The iron weight, in contrast, no matter how well travelled it may have been, will usually only reveal details of its most recent verification, with all previous history having been scraped and hammered away.[2]. Having scraped and hammered away a lot of history myself, in the line of duty, it is now a particular pleasure to encounter, as a collector, such weights which still bear old and interesting marks which have eluded the inspectors' rejection star and adjusters' chisel. Such 'original lead' is in my experience not common, but two nice examples have come my way, and both finds were achieved with more than a hint of serendipity, not to mention incredulity on my part. During a casual visit to a somewhat sparcely attended antique fair in Cleethorpes, I saw what I took to be a set of five, flat circular, domestic iron weights of indifferent quality and I almost passed by without a further glance. The fact that they did appear to be a matching set from 1 lb down to 1 oz. did cause me to turn them over and look at the base. Each weight bore, on a lead plug, a crown and the letters CO. ORK. This was not a mark I knew, but I realised that it was possibly interesting, so I casually enquired of the stall holder how much the weights were. He did not consider them valuable and a modest sum was agreed. I still do not know how this set of nineteenth century weights had stayed together, with their original stamps intact, for a hundred years or more, or how they had travelled the four hundred miles from the Isles of Orkney to Cleethorpes.[3].

Similarly, I am at a loss to explain how three ring weights of 7 lb, 4 lb, and 2 lb. denominations, all bearing the seaxes of Middlesex, came to be a hundred and forty miles away in a small scruffy emporium, on the coast of Lincolnshire, where I found them one wet Sunday afternoon. It is the very fragility of the marks in the lead, as opposed to those on copper plugs, gor instance, that makes their preservation particularly satisfying. This is even more so, when a set or partial set of interesting weights turns up intact, from the past, having evaded all attempts to obliterate its antecedents.

1....Under the weights and measures Act of 1963, section 43, inspectors were not allowed to undertake the actual adjustment. In effect, his assistants often tested, adjusted, retested and stamped, while the inspector concentrated on the far more important matter of doing the paperwork and collecting the fees.

2....We used to see quite a lot of anachronistic weights with multiple adjusting holes, holes in the upper surface, adjusting holes that were not undercut and had to be provided with a metal bar welded across to prevent the lead plug from falling out. Indeed, we encountered ring weights with the adjusting lead contained in a groove around the ring fitting; (in fact, the Middlesex weights referred to in the above article are of this pattern.) I even recall the odd $3\frac{1}{2}$ lb. weight turning up, which was, of course, entirely illegal and had to be disposed of. I'm afraid that, at the time, my view of such items was rather more jaundiced than might be the case today. When one was surrounded by large numbers of large lumps of metal, all of which had to be lifted on and off the scale a number of times, not to mention be scraped clean, have the new lead melted in and hammered flat, even I tended to lose sight of the finer aspects of the exercise towards the end of the day.

3....These days, I would enquire as to where the dealer had taken his holiday, admire his trading foresight and check as to whether his mother-in-law was an Orkadian! The editor was given a beautiful little pearl scale of classical Indian Ocean style by a man who worked in Bahrain, and had persuaded a pearl dealer to part with two of his old pearl scales which he had used as a young man. But who would have expected an English man in the 1960s to have a spare pearl scale lying around? Auction Houses spend a lot of time and effort providing the provenance of pictures;- perhaps we in ISASC should put the same emphasis on provenance.

Pre-1700 England Part 2 by D F CRAWFORTH

Even Robin Connor has had difficulty in tracing the beginning of the Avoirdupois system, as it separated off from the Troy system. The ounce for each was the same weight originally, but during the 13th and 14th century the convention arose that, when coarse goods were weighed, the customer got 15 ounces in his pound of goods (a libra mercatoria), but when fine goods of high value were weighed, the customer got only 12 ounces for his pound of goods (a Troy pound,)- in effect giving him an allowance of 25% for imperfections in the goods, when the libra mercatoria was used.

Fig. 1. A lead Avoirdupois weight of 8oz. with three lions passant, (walking towards the right, with their heads turned full-face,) the Arms of England used by all Kings from Richard I to Edward III (1189-1340.) As the Avoir system started around 1300 the weight must have been made between about 1300 and 1340. Note the hole for a thong which would cause the lions to be upside-down! The heavy slash across the upper right corner shows the ease with which lead can be damaged.

This libra mercatoria (mercantile pound) ran concurrently with the Avoirdupois pound of 7000 grains, which was divided into 16 ounces, each slightly lighter than a Troy ounce. It was referred to so ambiguously in early documents that it is difficult or impossible to ascertain what the scribe was writing about, so only artifacts can help to suggest the beginning of the

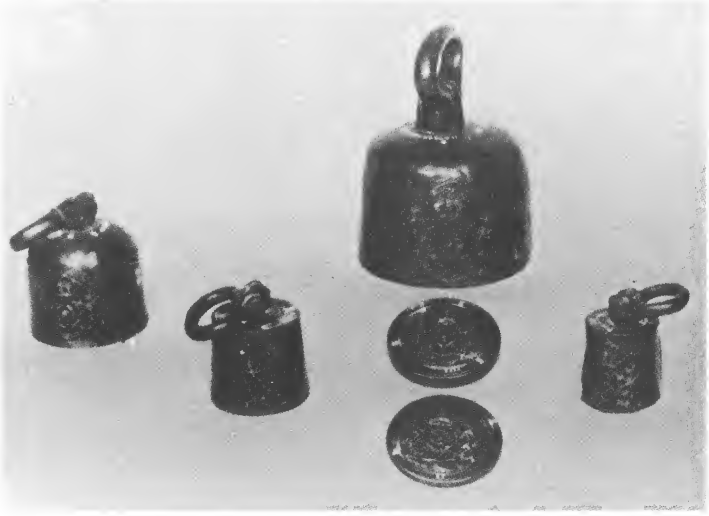


Fig. 2. Bronze weights with the Coat of Arms of Henry VII, (1485-1509,) made as official standards in 1497. The small denominations were cast as flat, stacking weights. Note that the Coat of Arms was cast even on the smallest weight, a tradition that died out at about this time, on flat weights.

Fig. 3. The main body of the weight was cast as a separate piece with a hole down the centre. A loop was made with long prongs that went right down to the bottom of the hole, so that when the ring was slotted onto the loop and the loop inserted, lead could be poured round the prongs to hold the ring securely even when over 100 lb. (50 kg.) was pulling on the loop. If the weight was below the standard, extra lead could be poured round the depression on the top of the weight and a verification mark impressed into the new lead.

use of Avoirdupois weight. The city of Winchester still has its set of official bronze Avoirdupois weights of about 1357, nicely stamped Crowned E (Edward III). The largest weight is the 91 pound, (quarter of a wool sack) weight which suggests where they were used, and why they were made. Robin Connor puts a definite beginning for the Avoirdupois system between 1250 and 1357 with a probablity of its being between 1280 and 1300. The libra mercatoria weighed 3% more than the Avoirdupois pound, but in common use, did any customer know whether the libra mercatoria or the Avoirdupois pound was being used? The gradual replacement of the libra mercatoria by the more useful Avoirdupois pound was finally given official sanction in 1532, when an Elizabethan Act of Parliament ordered that meat should be sold by Avoirdupois weight.

Elizabethan Standard weights were newly cast in 1558, in an attempt to clarify the exact weight of Troy and Avoirdupois systems. As the jury had no previous Standards on which to base their new weights, they used the

Fig. 4. This wool weight was cast during the reign of Henry VII,(1485-1509,) out of bronze. It exhibits the early style of having the hole at the bottom, so that the design was upside-down when hung up. The A for Avoirdupois shows clearly at each side and the crowned ℔ can just be made out at the centre top, upside-down!

Goldsmiths Troy weights as a basis for their calculations. The first set of Avoirdupois Standards were erroneously calculated as 16 Troy ounces, which made the Avoirdupois pound too heavy.

A second attempt was made in 1574, but the weight of a penny (from which they derived the weight of the ounce,) was taken to mean a Troy pennyweight, the Avoirdupois pound was confused with the libra mercatoria (3% heavier,) and the calculations produced Standards that were again inaccurate.

A third attempt was made in 1582, which proved satisfactory, so the second series were mainly destroyed, and the copies of the third series made for the 58 main towns in 1588. This third series served as Standards from 1588 until 1824, and comprised bell and flat weights in the Avoirdupois system, and nesting weights in the Troy system.

Fig. 5. The cover of R D Connor's invaluable book,'The Weights and Measures of England,' published by the Science Museum, London in 1987. It shows the 1588 Standard Avoirdupois bell and flat stacking weights and the nesting Troy weights, all made of bronze. The letters and numbers were stamped onto the flat weights,1 lb. down to ¼ oz. Amazingly, 5 different crown designs were used on the flat weights alone. The larger weights were engraved. Although inspectors' stamps are known of crowned EL, these are stamped crowned E, proving that even top inspectors had to wait for their new stamps after the new EL had been approved for use.

These immensely impressive Standard weights give us some clues as to the shape of ordinary weights of the Tudor period. A few trade weights have been found by people using metal detectors, and are much prized by their proud owners, even when they are deeply corroded by their years underground or under water. Some have the marks of Tudor monarchs but some can only be presumed to be Tudor by their shape. The nesting weights (Fig. 6.) fall into this latter category, being housed in a leather case of a design which fell out of use by the end of Elizabeth I's reign.

James I was the next monarch, and traditions remained virtually unchanged. (Fig. 7-9) Lead had never been used for Standard weights, being so easily damaged or shaved, but had been used since the Roman period for common trading. By the time of James I the dumpy bell/ring lead weights were used

Fig. 6. It would be impossible to date these Troy nesting weights if they had lost their leather carrying case, but, fortunately, the design of the leather was extremely distinctive as Elizabethan, and was not used after her death. Note that the inner cups have rings engraved round them, (often said to be a feature of the outer cup only.)

for larger masses, and the flat dumpy lead weights were for smaller masses. The Plumbers' Company had the right to check the accuracy of all weights used for trade purposes within ten miles of London, and they stamped an angel holding scales on to the lead as evidence that they were full weight. Bronze weights were used for fine weighing, but were checked by Founders' Company who stamped a ewer on to the bottom edge of the flat weights, well away from the monarch's crowned I and the dagger of St. Paul. Wool weights were always made of bronze at this period and were stamped like other bronze weights, with the crowned I, the dagger, the A for Avoirdupois and the Ewer, but they are easy to identify by the handsome Monarch's Coat of Arms in the centre of the weight. James I nesting weights sloped in and down in exactly the same proportions as late 18th century nesting weights, and can only be differentiated by the monarch's mark, a crowned IR.

It must be born in mind that James I ruled from 1603 until 1625, and that his nephew James II ruled from 1685 until 1689, so that we cannot with confidence differentiate between the weights of the two monarchs unless they are coin weights. No attempt to separate the weights of the two James has been made. Let us just say that any weight marked with a crowned I or IR must be 17th century.

Fig. 7. Lead 7 lb. ring weight with the denomination punched with a broad chisel, VII. The bottom originally flared out with the same profile as the bell weights in Fig. 5 but the soft lead has distorted over the years of use. No signs of an inspectors' stamp, so probably not used for trade.

Fig. 8. Lead bun weight of 1lb. Avoir, made during the reign of either James I or II,(1603-1625 or 1685-1689,) stamped crowned I, a dagger of St. Paul, and the angel St. Michael and scales of the Plumbers' Company. The heavy pitting was caused by the action of water during its sojourn in the River Thames, before being found by a metal-detector.

We have the same problem with Charles I who ruled from 1625 until 1649 and Charles II who ruled from 1659 until 1685. Again, let us just settle for weights being marked with a crowned C or CR, being 17th century and learn what we can. Attractive rectangular lead weights, stamped crowned CR (Fig. 10) were used for trade, and the flat bronze stacking weights were still made with their flattened profile. Lead weights were dumpy 'cakes' checked by Plumbers' Company, but stamped with a different angel and scales;- Why Plumbers' Co. replaced their stamp has not been explained. Lead cannot have damaged the stamp or worn it away much, so why replace it? There is room for a study of Plumbers' Co. stamps, which might do much to help in sequencing these weights. Has anybody seen and handled enough James and Charles weights to do this work?

Fig. 9. Bronze wool weight with the Arms of James I cast into it. During the reign of Elizabeth I, (1558-1603) the Arms stopped being cast upside down and from the time of James I,(1603 to 1625) wool weights were more or less of this profile until their demise in the reign of George III,(1760-1820.) Note the heavy wear on the front surface, possibly caused by rubbing when carried over the back of a pack-horse under other goods.

Fig. 10. Lead rectangular ring weight of 14lb. chiselled XIIII, and stamped crowned CR by an inspector. Not stamped by Plumbers Company, so not used within three miles of London.

Scales prior to Charles I period cause immense problems in dating and provenance (Fig. 12.) Four beam ends are shown which are crude, of types that date back many centuries, and are illustrated in Continental paintings from the 14th century onwards. They may have been made in England, (they were bought in England,) either very early and considered at the time to be adequate for trade, or made after 1650 by blacksmiths in out-of-the-way villages to use on farms or in kitchens, without the need for precision. Who can say?

Fig. 11. Fine 1lb. lead bun weight, stamped with crowned C, dagger of St. Paul and the angel and scales of Plumbers' Company. Lead is so dense that the one pound weight is roughly the same size as an eight oz. brass weight.

Fig. 12. Four iron beam ends, all exhibiting primitive characteristics, lacking knife-edges. The top one and the third one down could easily be bent either to falsify or to correct a beam. Bought in English antique shops, but country of origin unknown.

Illustrations done in English books before 1650 tend to show the scales very sketchily, (Fig. 13) and not to give the collector any help with dating. It is interesting to see that the hanger and plate were being used in 1638 to give easy access to the goods plate, but the beam ends could be any shape.

Fig. 13. A woodcut from Artachthos by John Penkethman, published originally in 1638 and republished in 1748. The swan necks are just discernible but the pendant and pointer design are not clear. If the woodcuts were in the earlier edition, then the hanger and loose pan were illustrated for the first time.

We can do much better with coin scales, (Fig. 14 on) because so much more can be used as evidence;- the weights for specific coins, the shape of the weights, the style of the box, the beam design, the beam ends, the maker's marks and the book stamps used to decorate the outside of the box. The maker ℙ was working soon after Briot came to England to make coin weights in 1632, when regulations stated that coin weights had to be round, (not square,) but when the coins of James I were still in use and had to be weighed.

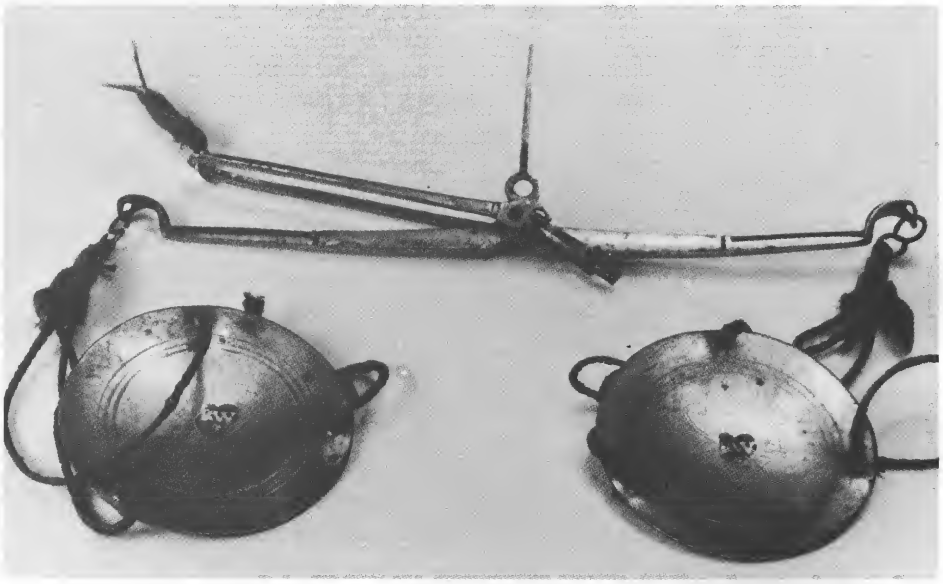


Fig. 14. Coin scale beam by RW. Box missing. Typical early 17th century beam- square central section, keeled wrists, & plain curve under the central pivot. Normal high swan neck ends Typical silvered pans with makers' mark. Cheaper version pointer made of flat iron pierced near the base. Long shears.

Fig. 14 shows clearly that coin scales had a Germanic influence;- the swan neck ends with round holes could easily have been made in Germany in 1632- but the cut away below the central pivot, the knobby pendant and the circular brass pans rubbed with silver are classically English characteristics of the period. The slightly up-swept beam, the shears the same length as half the beam, the rectangular central section on the beam and the pointer made of flat iron with a hole pierced in its base are all early features that changed their design over the next hundred years and must be used as internal evidence for dating. Even the pointers being shorter than its en-

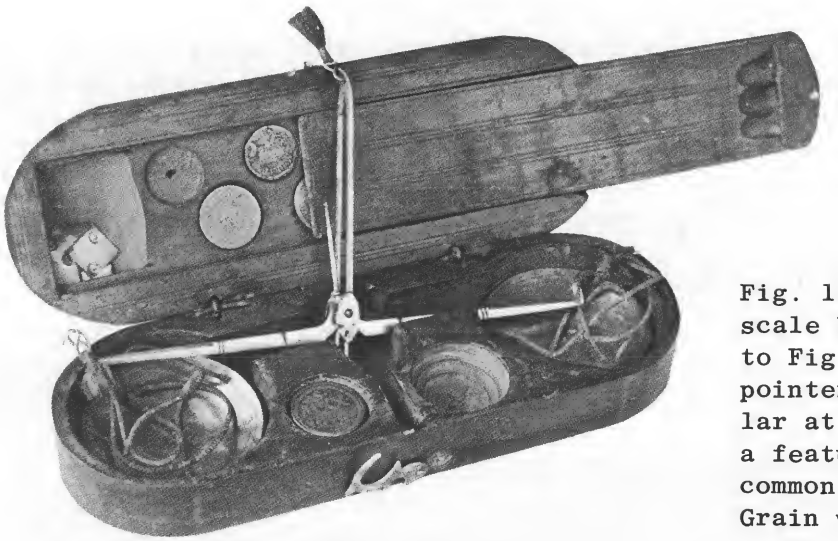


Fig. 15. Complete coin scale by RW. Very similar to Fig. 14, except that the pointer was cast with a collar at the tip & at the base, a feature which became more common in the next century. Grain weights have survived.

closing shears is not evidence that it was trapped and snapped by putting it into the box clumsily but is evidence that it was made intentionally short during the first half of the 17th century. The maker's mark, RW in a heart with a flower below the initials, is again evidence of the early 17th century;- English makers stopped marking their iron work and relied on their trade label, stuck into the lid of the box,after about 1690. In nearly all these indications of period, there are exceptions known, as for example on the scales made by Henry Neale, who did much of his work after 1700, he did stamp his initials in the pan- but all other aspects of his work show normal design features used by his contemporaries. The rule must be;- Count up the early features and assume that a scale with very few of them is not as early as you had hoped! Take into account that scale makers could be as old fashioned in their work as any other hand-craftsman, but that customers usually wanted the latest ideas and would not pay for anything that was too obviously old-fashioned.

The same holds good for box design. Early 17th century boxes had to hold weights for at least twelve coins, but because people were very conscious of the effects of wear and tear on the brass, the weights were kept apart in separate holes in the wood. On the Continent it was normal to put a drawer under the scale compartment but in England, it was normal to make

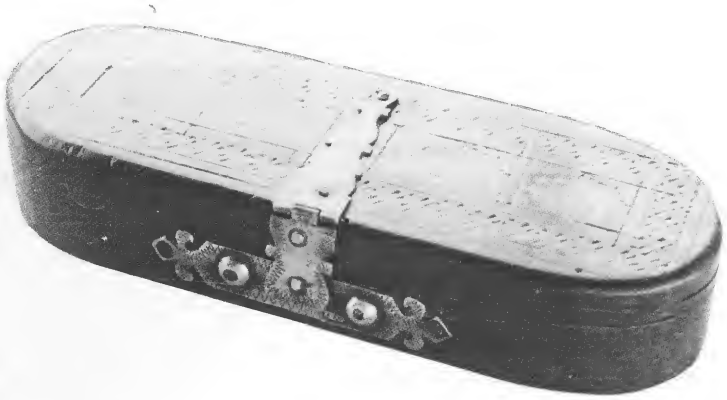


Fig. 16. Outside of another box by RW. The rectilinear diaper pattern surrounded a rose & crown motif along the centre of the box, a motif which died out before the Cromwellian period.(1649-1659.) Only the right hand button worked the spring catch. The left hand one was a dummy.

the lid of the box thick and substantial, so that a set of holes could be drilled in the lid and a flap attached to cover the weights and prevent them from cascading out when the box was opened. Some times the flap had hinges at the top, sometimes it had hinges at the side, and sometimes it was in grooves and slid over the weights. Even though brass was an expensive imported product, the hinges and the catches were handsomely made using large amounts, relatively, of the precious metal. Several boxes are known with heart-shaped hinges, and TP matched his heart shaped hinges with a heart shape cut out of the pointer.

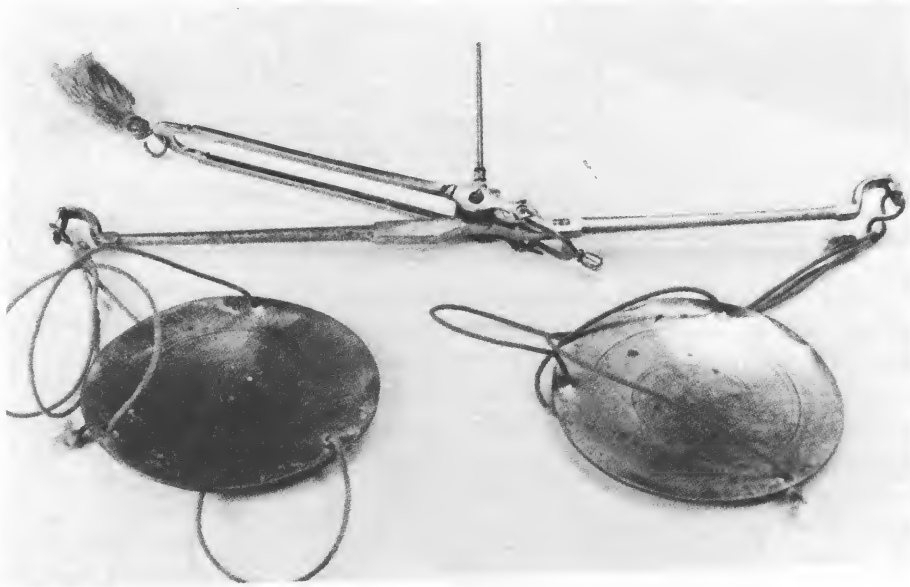


Fig. 17. Coin scale by TP. Circa 1635. Highly polished iron beam, with square section central part and keeled towards the 'wrists! Plain curve under the central pivot and heavy knobbed pendant. Shortish pointer but typical long shears. Silvered pans & green silk tassels.

The 1630ish boxes were usually round ended, made out of fruit (pale) wood, decorated on the outside with book stamps, not polished inside and not lined with fabric. They were usually about 7 inches (17 cm.) long and about 1¼ ins. deep.

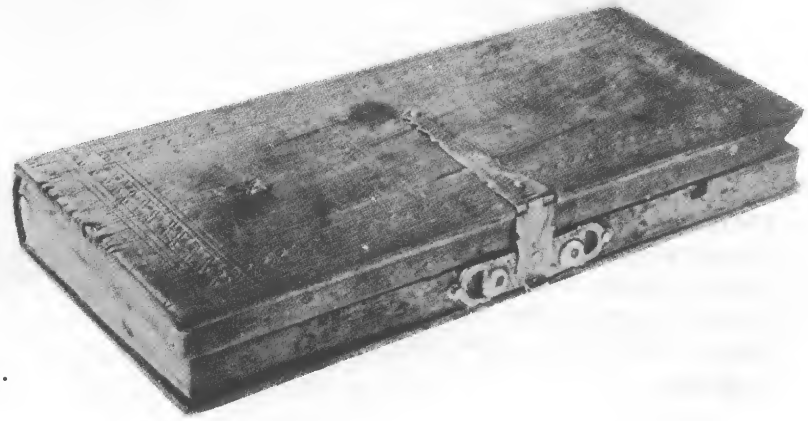


Fig. 18. The outside of the box by TP, with the cheap flat brass strap decorated with wriggle-work. Imitation books were regularly made during the early part of the 17th century.

Fig. 19. A classic 1630s and 1640s coin scale by TP. The round ended box was more common than the rectangular box, but both were stamped with rectilinear patterns made up from various arrangements of book-makers' stamps. The sloping depression in the lid held the grain weights,(which virtually always got lost,) and the ten drilled holes held weights for the

XI s...IR MAG BRIT.
X s....CAROLUS REX.
X s....ANGEL
V s VI D...IR M BRIT.
V S VI D...ANGEL.
V S....CAROL REX.
II S IX D...IR M BRIT.
II S IX D ..ANGEL.
Others lost or replaced later.

The holes in the base held another four coin weights originally. See the article on English Coin Weights by Norman Biggs, especially pages 1010-1016.

Fig. 21 shows scales made by Samuel Neale, who was apprenticed to Henry Sherman, a member of Blacksmiths' Company in London. Samuel finished his training in 1644, and his work has many of the features discussed above, plus some interesting ones that are not so common. He was a free member of Blacksmiths' Co. himself, and he took their Coat of Arms as his symbol, a

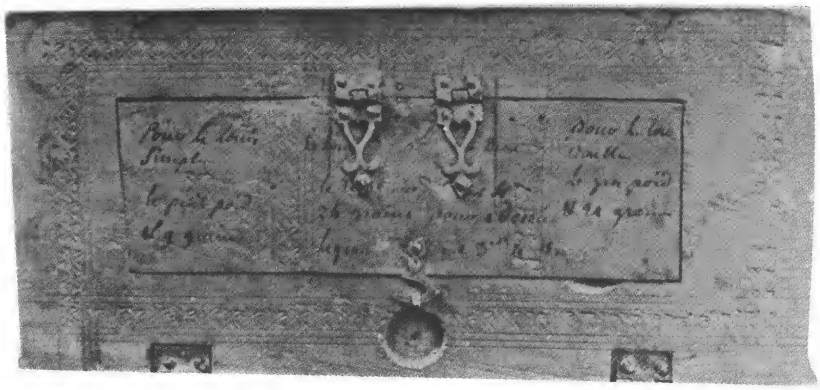


Fig. 20. The lid of a box by TP, showing the cast brass hinges used to secure the inner lid which prevented the weights from falling out when the box was opened. The box was used by a French speaker, who wrote in ink on the fruit-wood.

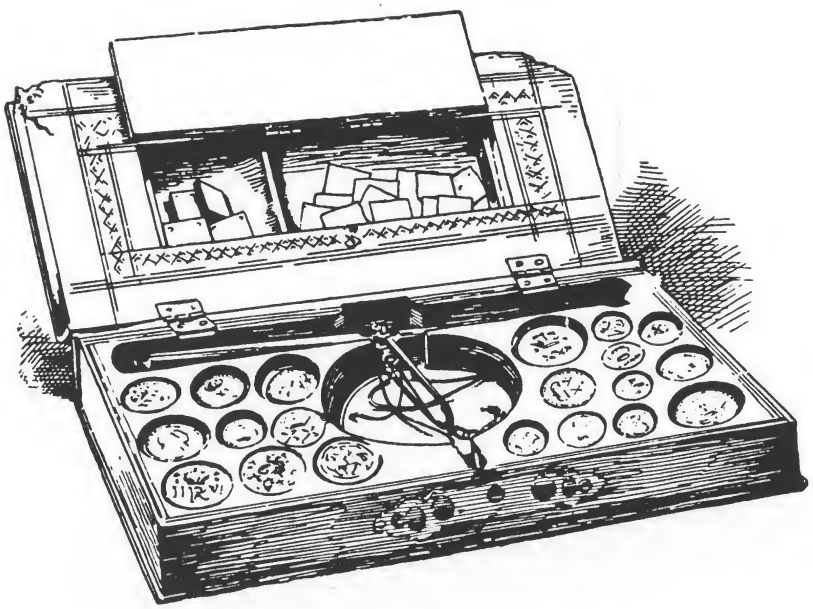


Fig. 21. Exceptionally large book-shaped box by Samuel Neale, with cast strap imitating a twisted cord across the top of the box. Original weights of James I & Charles I have been supplemented or exchanged. Square Troy weights in left pen in the lid might be original. Weights for Charles I 2/6 may be indication that the set originally was for silver coin, or it may have had apothecary weights. Unusual.

crowned hammer. He must have felt that their prestige would give him an advantage;- How humiliated he must have been when he was stripped of his high office in the Company later in his life, because he had been unwise enough to side with the Parliamentarians against the Royalists. Did he then want to drop the use of the hammer and crown?

Fig. 22. Samuel Neale's stamp of the Hammer and Crown, taken from the Coat of Arms of the Blacksmiths' Company. The same symbol was later used by Henry Neale.

Fig. 24. Classic book-binders' stamps, showing the diaper design and the ornate fleur-de-lys characteristic of boxes from about 1630 until about 1710. The tiny curls got damaged when they were hammered down onto the fruit-wood, and by using a lens one can identify a particular stamp and trace its use by one box-maker. This provides evidence that at least six scale-makers were buying their boxes from one box-maker, in the late 1600s. This pattern was on the 1682 box by Samuel Neale.

to be continued

ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

1990—ISSUE NO. 3 PAGES 1357-1384

PAGE 1358

Cover Picture

This coin scale shows all the characteristics of an English scale of the early 1630s. The heart-shaped hole in the pointer, the long shears, the relatively short pointer, the deep arch under the central pivot, the square beam changing to a keeled beam, the heavy knob on the pendant, the pointer being made of flat iron and TP being stamped in the pans, all features of scales of that period. There is a tiny stamped CR on the beam, which might be an inspectors mark, during the reign of Charles I. Beam 4 inches (120mm)

The box is also classic, made of fruit wood, the long flat strap catch having wriggle-work, book-maker's stamps used as ornament, holes for twelve weights in the base and in the lid, heart-shaped holes pierced in the hinges, one false and one real button to work the spring catch and weights cast with a tiny B. Briot designed the coin weights made after 1632.

Notes & Queries

NQ 112 QUERY FROM L A UIT DEN BOOGAARD

On a trip to England I bought a very nice and complete nesting weight set for 32 ounces Troy, with 8 cups, the biggest being marked XV1, and ℞.

Only a couple of months ago I started to weigh the cups, and I was quite surprised to find that the ounces were avoirdupois, not Troy.

I discussed this with G M Houben and he said,'This must be very old and sure to have been made before 1580.'

Zupko's book 'A Dictionary of Weights and Measures for the British Isles,' states on page 15, " The Seventh Annual Report of the Warden of the Standards on the Proceedings and Business of the Standard Weights and Measures Depart-

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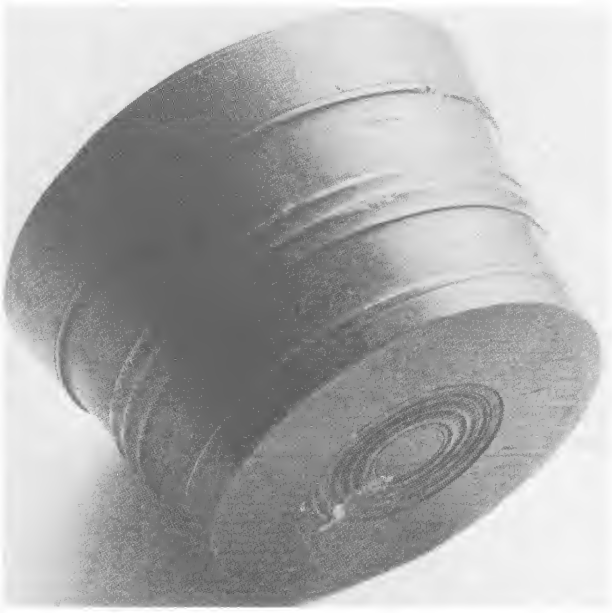


ment of the Board of Trade for 1872-73 quotes (an anonymous) document saying "The same Tyme ordeined that xvi uncs of Troie maketh the Haberty poie."

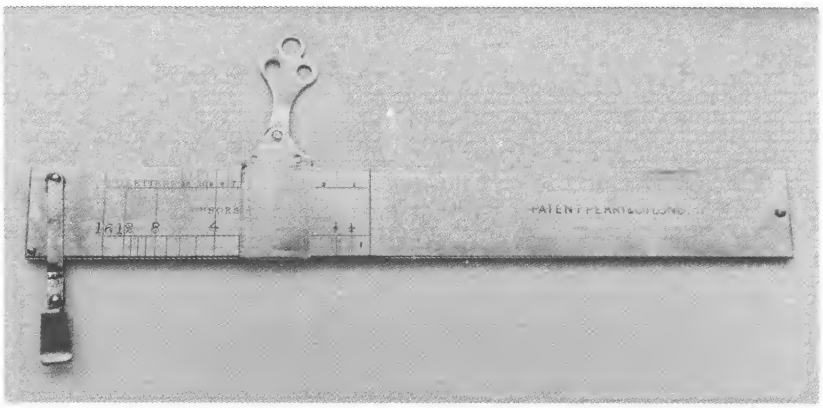
The precise weight of each cup is as follows;-

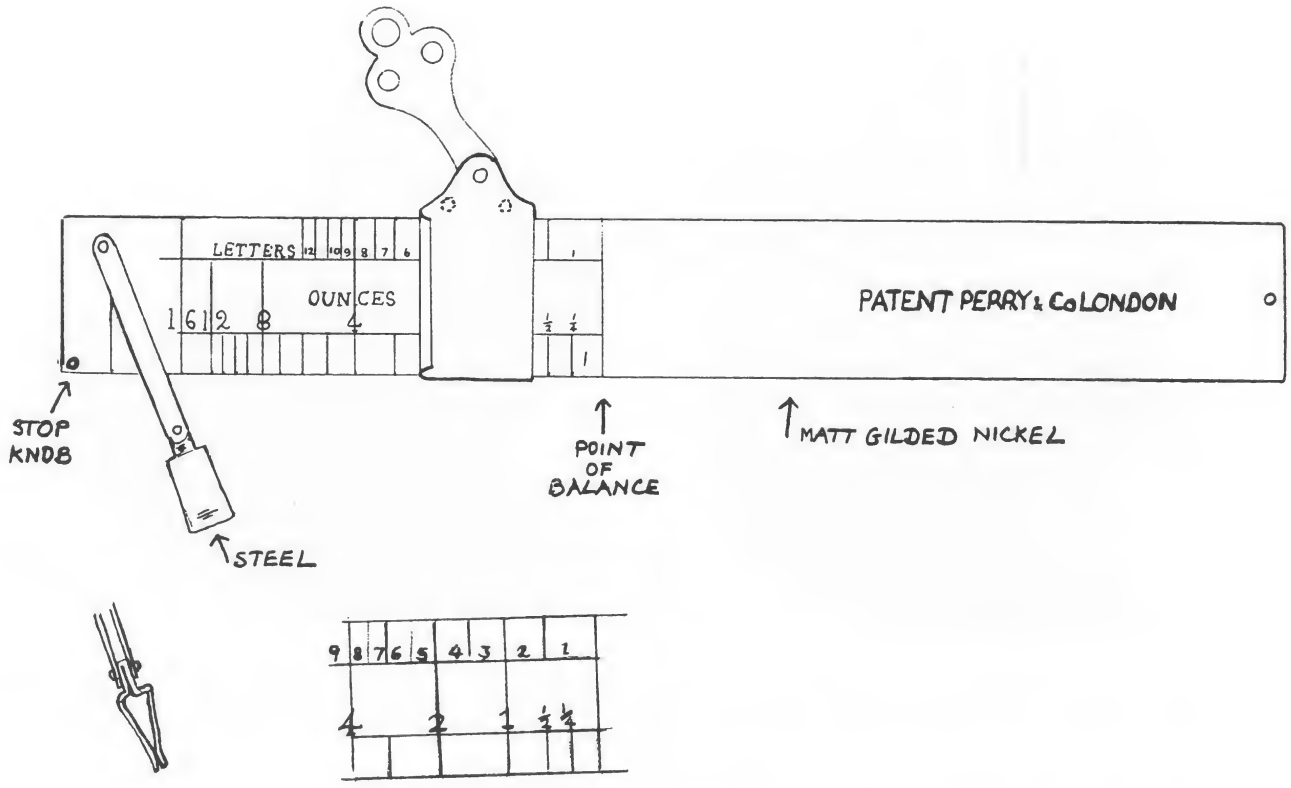
No. 1....453 grams	No. 5....28.1 grams
No. 2....225.4 grams	No. 6....14 grams
No. 3....112,4 grams	No. 7....7.6 grams
No. 4.....56.5 grams	No. 8....7.6 grams

giving a total weight of 904,6 grams. Sixteen ounces Avoirdupois have a modern weight of 453.6 grams, and sixteen ounces Troy have a weight of 466.6 grams, so my weights are unmistakably thirty two ounces Avoirdupois.

So, is this the oldest cup-weight in England? Who knows more about this matter, and who can solve this puzzle?

Showcase





This letter bismar is delightfully simple;- just a flat bar with a flat saddle sliding along to find the point of equilibrium, and a flat swinging clip to hold the letter. It could look primitive, but it is so beautifully made that it is more reminiscent of a scientific instrument than a postal scale. Of course, because it is a bismar, it is less and less accurate in practice as the letter gets heavier and the graduations get smaller, but as most letters weigh less than half an ounce, that was not a problem.

Perry & Co. were manufacturers, patentees, aromatic elastic bands, perennial metallic books, paper binders, Bostonite tablets, pen and pencil manufacturers, wholesale dealers in stationers sundries...so scales fitted well into their stock. Whether they were manufacturers of scales is obscure. Scales have been seen with all the characteristics of Samuel Turner Senior and of Narcisse Briais but with Perry & Co. stamped on the beam. They were in business from 1831 until 1896. The postal rates on this rarity show that it was made between 1840 and 1865. 9½ inches (245mm) long.

Owner J Lenorowitz. Drawing by A Crawforth.

Contemporary Comment

LA NATURE, 1st quarter of 1887

BALANCES WITHOUT WEIGHTS

Sent by H Gacon

We have before had occasion to tell you, in these articles, of a number of balances in which the loose weights on the apparatus are abolished. These weights are usually replaced by a small mass sliding past a divided arc forming a lever. In these little balances, about which we are informing you today, there is no longer a weight to be manipulated. The weight of the object to be weighed is directly indicated by a little pointer.

These ingenious instruments are made by M G Restorf.

The first balance is a little steelyard given the name,'Letter Weighing Manometer,"(Fig. 1) comprising a parallel linkage represented by a dotted line on our diagram, the main direction of the parallelogram is extended to form, about the main pivot point, a bent lever on the end of which we find a counter-weight carefully calculated to allow it to give the pointer movement over the dial.

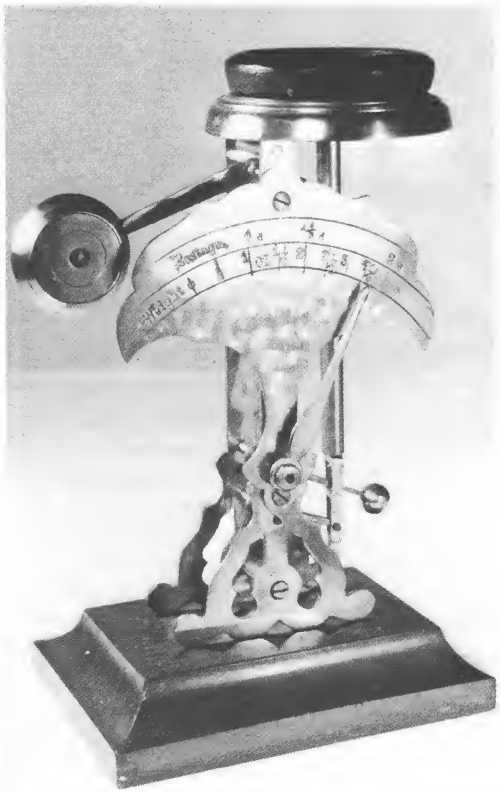


Fig.1..Restorf's patent, made by Marion, London (in cartouche on back) for the British market. A weight made of iron is on the letter plate, pushing the parallelogram down, and the counter-balance up on the left-hand side (whereas it came up on the right-hand side on the patent.) 185mm high. All brass.

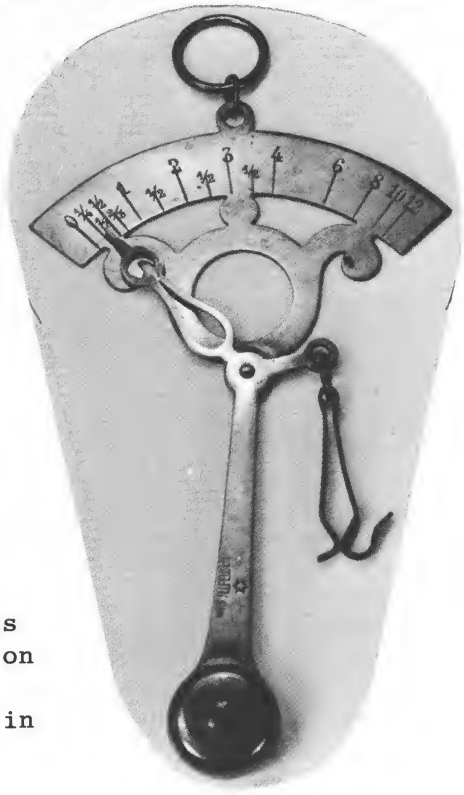


Fig.2..Restorf's patent no.171632 of 1885 in its hand-held version, with Jos. Illfelder stamped on the arm. Made for the British market while the Postal Union was in force. Patented in Britain in 1871 by Ragg. Nickelled brass, 150mm high.

BALANCES SANS POIDS

Nous avons déjà eu l'occasion de signaler à nos lecteurs un certain nombre de balances dans lesquelles les poids mobiles indépendants de l'appareil sont supprimés [1]. Ces poids sont généralement remplacés par une petite masse glissant sur une règle divisée formant levier. Dans les petites balances que nous allons faire connaître aujourd'hui, il n'y a même plus de masse à déplacer. Le poids de l'objet à peser est directement indiqué par une petite aiguille indicatrice.

Ces appareils ingénieux sont dus à M. G. Restorf, constructeur.

La première balance est une petite romaine désignée sous le nom de *pèse-lettres manomètre* (fig. 1), elle se compose d'un parallélogramme articulé représenté en pointillé sur notre figure; le côté supérieur de ce parallélogramme se trouve prolongé et forme, par son axe de suspension, un levier du premier genre à l'extrémité duquel se trouve un contrepoids convenablement calculé, afin de laisser parcourir à l'aiguille le chemin du cadran.

Dans le but d'éviter les résistances passives dues à une roue engrenant sur un pignon, ce qui ôterait de la sensibilité à l'appareil, l'aiguille ne se trouve pas placée au centre du cadran, mais excentrée comme cela est souvent le cas pour les manomètres de chaudières à vapeur.

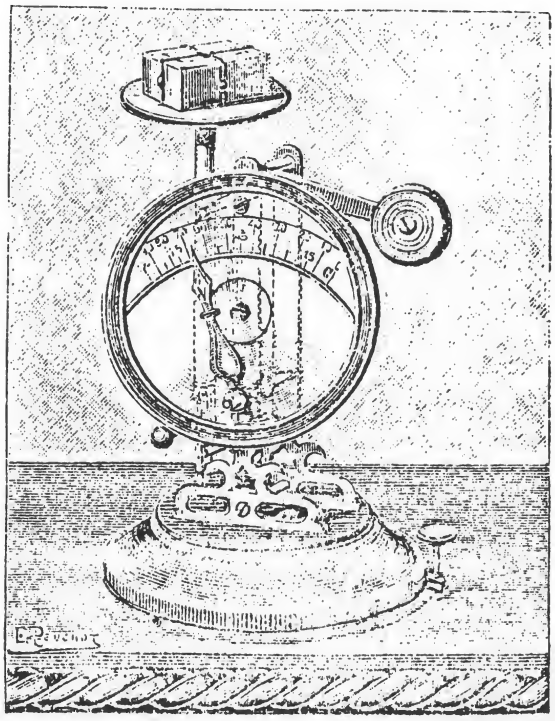


Fig. 1. — Balance manomètre sans poids.

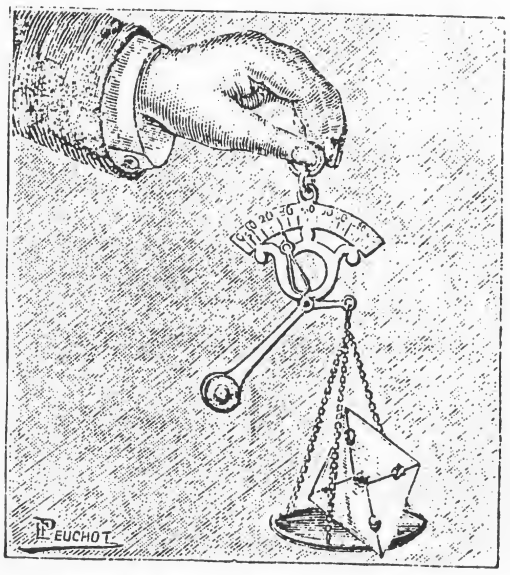


Fig. 2. — Petite balance de poche pour peser les lettres ou les produits photographiques.

Cette disposition permet de n'avoir, comme organe de transmission de mouvement, qu'un petit levier fixé sur l'axe de l'aiguille : ce petit levier étant muni d'un contrepoids excédant un peu le poids de l'aiguille, il en résulte que, reposant simplement sur la tige mobile, il suit les moindres oscillations de la tige mobile du parallélogramme qui supporte également le plateau sur lequel se posent les objets à peser. Ces objets peuvent, selon la force de l'appareil, aller de 60 grammes à 500 grammes. Notre figure 1 représente un petit colis postal posé sur le plateau de la balance.

La petite balance romaine de poche que nous figurons au-dessous du premier appareil (fig. 2) ne nécessite également aucun poids; elle a été construite plus spécialement pour peser en campagne les produits nécessaires à la photographie, mais elle peut être aussi bien employée pour peser les lettres; elle se compose d'un levier du premier genre, à une des extrémités duquel se trouve un petit plateau et à l'autre, un contrepoids équilibrant jusqu'à 100 grammes les produits à peser se trouvant dans le plateau.

Une fois les pesées terminées, le cadran, l'aiguille et le contrepoids se replient et prennent presque entièrement place dans le plateau, ce qui permet de mettre tout l'appareil dans une sacoche photographique ou dans sa poche.

Sur ce principe de levier, se font également des pèse-lettres de poche qui sont alors munis d'une pince au lieu d'un plateau et qui pèsent de 20 grammes à 500 grammes selon la grandeur de l'appareil. Les balances que nous signalons sont nickelées et fort bien construites: il nous a semblé qu'elles étaient de nature à être signalées comme propres à prendre place dans le matériel du bureau.

[1] Voy. 1881, 1er et 2e semestre. Tables des matières.

With the aim of reducing passive resistance due to a cog's engaging on a pinion which takes away the sensitivity of the instrument, the pointer is not found in the centre of the dial, but eccentrically in the same way as is done on manometers used to test the heat of gases.**(sic)**

This arrangement allows, as organ of transmission of the movement, a small lever attached to the axle of the pointer;- this little lever is provided with a counter-weight slightly heavier than the pointer's weight, which has the result that, resting straight on the moving rod, the pointer follows the slightest movement of that vertical rod which is part of the parallelogram which keeps level the plate on which the object is placed to be weighed. These objects can range, according to the ruggedness of the instruments, from 60 grammes to 500 grammes. Our first diagram shows a little parcel placed on the plate of the balance.

The little pocket steelyard, which we show below the first instrument, also avoids the need for weights, being specially constructed to weigh, whilst away from home, the products necessary to do photography. (Editor's note;- When glass plates were used, the photographer set up a mobile dark-room to develop the plates immediately after he had exposed them.) but the scale could also be used to weigh letters. It comprises a bent lever, which has on one end a little pan, and on the other end a weight to balance a load of up to 100 grammes in the pan.

Once the weighing is finished, the dial, the pointer and the counter-weight are tucked into the pan, and that permits the whole instrument to be slipped into the photographer's bag or into ones pocket.

On this principle of leverage pocket letter balances are also made which are provided with a clip instead of a pan, and which can weigh anything between 20 grammes and 500 grammes according to the size of the instrument. These balances, which are nickel plated, we can assure you are very well constructed. It seems to us that by their nature, they are particularly well-suited to being included amongst the equipment in a desk.

translated by R L Hitchins

HINTS TO HELP TO DATE FRENCH POSTAL SCALES

As few rates are available to the author to give the amount paid by the French at any specific date, these clues below may be of some slight assistance.

1793..Weight in GRAVES, Distance in LEAGUES, Price in LIVRES, LOUIS SOLS & DENIERS.

1795..Weight in GRAMMES,Distance in LEAGUES, Price in LIVRES, LOUIS SOLS & DENIERS.

1799..Weight in GRAMMES,Distance in KILOMETRES, Price in FRANCS & DECIMES
Single letter rate..0-7g
Double letter rate..7-10g
Next rate.....10-15g
Steps on.....5g

1800..Post Offices sent brass weights up to 500g & iron weights over 500g.

1801..April..Weights made in the form of rounded skull-caps nesting inside each other of 3,5,7,10,15,20,30,40,50,100, & 200g
Ordered to be sent to each Post-Office but never seen by Lavagne.

1801..May....Single letter rate.....0-6g
1 Decime more than the single letter rate..6-8g
1½ times the single rate.....8-10g

1806..The weight steps stayed the same but the price per step increased.

1812..As the kilogramme and the gramme system was so hated, each weight used in Post-Offices was to be stamped with its nearest equivalent old name, so that
500g was stamped 1 LIVRE
15g was stamped 4 GROS or ½ ONCE
8g was stamped 2 GROS or ¼ ONCE

1827..Single letter rate..0-7½g...
Double letter rate..7½g-10g
Next rate.....10-15g
Steps on.....5g
} Distance reduced to'Post-Offices 40k apart!

1833..Postal Union between Britain and France, only revoked in 1875.
Single letter rate for British Letters..0-7½g
Double letter rate for British letters..7½g-15g
Next rate for British letters.....15-22½g
Next rate for British Letters.....22½-30g
Steps on for British letters 7½g

1837..Postal Union between Prussia and France, only revoked in 1875.
Single letter rate for Prussian letters.....0-11½g
1½ times the single rate for Prussian letters..11-½15g
Twice the single rate for Prussian letters.....15-22½g
2½ times the single rate for Prussian letters..22½-30g
Steps on for Prussian letters at ½ the basic....7½g

1849..For any distance within France....20 centimes.. 0-7½g
40 centimes..7½-15g
1 franc.....15 -100g

1850..For any distance within France...25 centimes....0-7½g
50 centimes...7½-15g
1 franc.....15-100g

1854..For any distance within France...20 centimes....0-7½g
50 centimes...7½-15g
80 centimes..15 -100g

1862..For any distance within France....20 centimes....0-10g

1870..For any distance within France....25 centimes....0-10g

1875..Postal Unions with Britain and Prussia revoked.
For any distance within France....25 centimes....0-15g
15-30g
30-50g

1878..For any distance within France...15 centimes.....0-15g

1906..For any distance within France...10 centimes.....0-15g

1910..Special rate for printed paper only.....0-15g
Rate for letters.....10 centimes.....0-20g

1917..For any distance within France...15 centimes.....0-20g

1920..For any distance within France...25 centimes.....0-20g

1925..For any distance within France...30 centimes.....0-20g

1926 (May).....40 centimes.....0-20g

1926 (August).....50 centimes.....0-20g

1932.....65 centimes.....0-20g

1938.....90 centimes.....0-20g

1939.....1 franc.....0-20g

1942.....1.50 franc.....0-20g

1945.....2 francs.....0-20g

1946.....3 francs.....0-20g

1947..(1st. January).....5 francs.....0-20g

1947..(2nd. January).....4.50 francs.....0-20g

1947..(8th. July)..,.....6 francs.....0-20g

1948.....10 francs.....0-20g

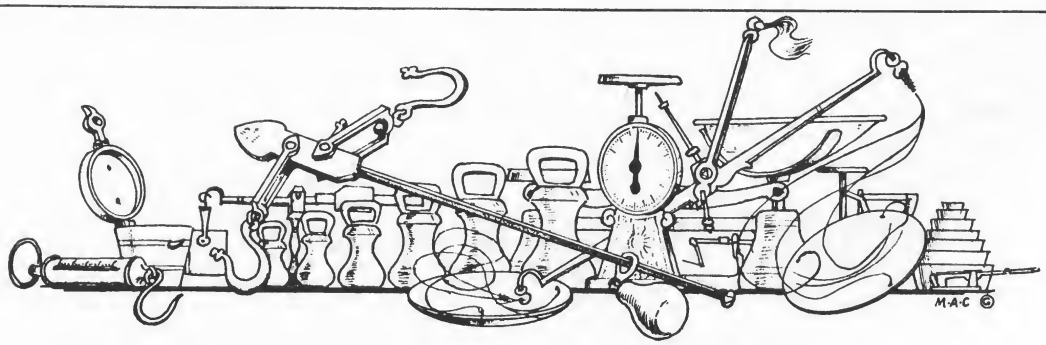
1949.....15 francs.....0-20g

1957.....20 francs.....0-20g

1959.....25 francs.....0-20g

1960..Value of money increased by 100%..25 cents.....0-20g

1965	30 cents	0-20g
1969 A non-urgent service operated	30 cents	0-50g
Urgent letters	40 cents	0-20g
1970 Non-urgent letters	30 cents	0-20g
Urgent letters	50 cents	0-20g
1974 Non-urgent letters	60 cents	0-20g
Urgent letters	80 cents	0-20g
1976 Non-urgent letters	80 cents	0-20g
Urgent letters	1 franc	0-20g
1978 Non-urgent letters	1 franc	0-20g
Urgent letters	1.20 francs	0-20g
1979 Non-urgent letters	1.10 francs	0-20g
Urgent letters	1.30 francs	0-20g
1980 Non-urgent letters	1.20 francs	0-20g
Urgent letters	1.40 francs	0-20g
1981 Non-urgent letters	1.40 francs	0-20g
Urgent letters	1.60 francs	0-20g
1982 Non-urgent letters	1.60 francs	0-20g
Urgent letters	1.80 francs	0-20g
1983 Non-urgent letters	1.60 francs	0-20g
Urgent letters	2 francs	0-20g
1984 Non-urgent letters	1.70 francs	0-20g
Urgent letters	2.10 francs	0-20g
1985 Non-urgent letters	1.80 francs	0-20g
Urgent letters	2.20 francs	0-20g
1986 Non-urgent letters	1.90 francs	0-20g
Urgent letters	2.20 francs	0-20g
1987 Non-urgent letters	2 francs	0-20g
Urgent letters	2.20 francs	0-20g



French Patent Postals

PATENTS RESEARCHED BY H GACON.
Comments by D F Crawforth.

As the information available to English-speaking researchers on French patents and on the French postal system is severely limited, these comments are embarassingly inadequate. With great diffidence I set them down, in the hope that they will start trains of thought, provoke research and encourage communication.

It is interesting to compare Britain and France because the two countries had roughly the same population size, and approximately the same degree of literacy at the beginning of the 19th century. France had twice the land area and during the 19th century the great majority of the French lived in rural surroundings, leading lives of independence, whereas the British were clustering in towns and very much more dependent on an efficient infra-structure to keep them supplied with goods and services. Did this affect the number of letters that were sent?

It would have been more difficult for a Frenchman to get to a Post-Office, due to the greater distances between towns, but maybe he needed to write more letters to obtain what he needed. Did he need to write more letters to keep in touch with his relatives, or were they more local?

Some comparisons between the French postal system and the British postal system are interesting. Even in the 18th century the French weighed each letter to assess the postage to be paid, whereas the British carried any letter at the lowest rate as long as it comprised only one sheet of paper, regardless of its weight and bulk!

Then in 1839, the British took the imaginative step of allowing any letter below the weight of half-an-ounce to travel at the lowest rate for any distance within the British Isles. It was not until 1849 that the French abolished the greater payment for the greater distance.

The British changed their letter-writing habits radically when the penny-post started in 1839, as it had suddenly become very much cheaper to send letters. Was there a similar change in France in 1849? The patents do not reflect any surge in interest in France, whereas, in Britain, there was a sudden increase in patents and registrations of postal balances in 1839. It is impossible for me to explain the French inertia. Was it because there was no reduction of benefit to the user? Were their Post-Offices so efficient that the French saw no need for owning their own scales? Was there no social cachet to be gained by having evidence of your letter-writing prominently displayed in your house in France?

The regulations governing French post-masters stated that they must use equal-arm balances with a sensitivity of 0.5g.(In Lavagne's book,'Petite Histoire Du Pesage Dans L'administration Postale', no mention is made of

the load to be applied before checking the sensitivity.) Post-masters were not allowed to use Roberval scales officially, as their sensitivity was considered too poor for postal use. Actually, the Ministry that supplied scales and other equipment to the post-masters had many robervals in its supplies when stock-taking was done in 1886. These could be used to weigh unimportant things like newspapers, but a suspicion arises as to the real use of these robervals!

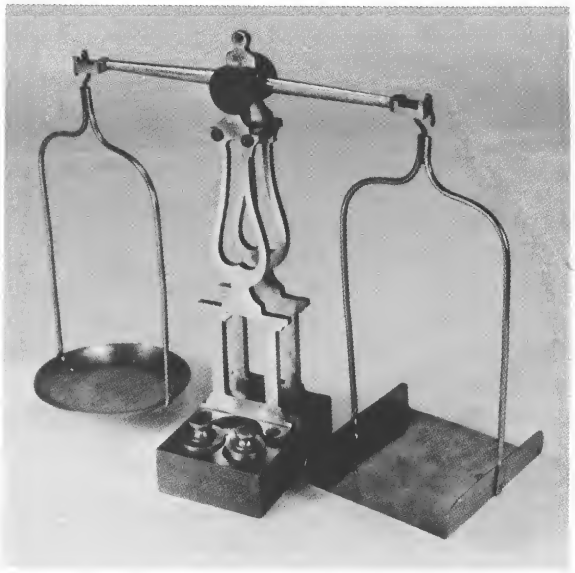


Fig.1..French postal scale with equal arm beam, stamped DV on the central boss. Weights for 7½ and 15 (grams.) so made before 1854. Beam made of steel and hangers and pillar made of brass. Open box ends with typically French horns making a deep location for the hangers' hooks. The letter had to be placed in the hanger vertically, as the letter plate is only 50mm across. 6 inches (150mm) high.

Of course, the type of scale demanded by the Law had no bearing on the type of scales that could be sold for private use. The public would have been familiar with the scales in their local Post-Office, and associated them with letter weighing, but possibly they wanted novelty when they chose a scale for their own use.

If the patents can be taken as a guide, then the main novelty that attracted the French was the pendulum balance. It was simple to construct, so was relatively cheap. The user could easily put the letter on the hanger or top

PRINCIPLES PATENTED

PRINCIPLE	FRENCH	BRITISH	PRINCIPLE	FRENCH	BRITISH
PENDULUMS	14	16	MOVING LOAD SCALE	1	7
STEELYARDS	8	22	EQUAL ARM SCALES	1	-
COIL SPRINGS	6	10	BISMARS	-	13
FLEXURE SPRINGS	2	1	WEIGHT LIFTING	-	6
CORD & WEIGHT PENDULUMS	1	2	MODIFICATIONS	2	15
HYDRAULIC	1	3	TOTAL	36	95

pan, and he could read the weight instantly, without recourse to weights. The British favoured the half-roberval and steelyard, which was rugged, gave easy access to the pan, and looked handsome, but it was more expensive to make, it had to have a stand and sit on a surface, and the user needed two hands to steady the scale while moving the counter-balance along the beam. The British also liked the weight-lifting steelyards which were incredibly elaborate, difficult to make, made a charming rattling noise in use and, again, had to have a stand, but did have the advantage of instant read-out. As well as liking expensive and ornate scales, the British liked the primitive 'sticks', that is, the bismar, the moving load steelyard and the true steelyard, all of which needed careful manipulation to keep the letter in its holder, the 'stick' on the table and the weight correctly positioned;- charming in their simplicity but impractical to use. The French solutions were more sensible, if less interesting to the student of scales!

Fig.2

SCALES	FRANCE	BRITAIN
Expensive to make....	....12....	19
Middling cost to make	....15....	27
Cheap to make.....	....9.....	43

These comments are based on the 36 patents found in the French archives and the 95 patents found in the British archives. France and Britain had a similar population, so this disparity in numbers needs thinking about.

Was it because fewer novelties would sell in France? The French had simple equal-arm scales with the minimum number of weights to deal with normal household use, that is, two weights only for many years, and three weights only for many more years. Were manufacturers deterred from putting new types on the market, when the straight-forward style shown in Fig. 1 was so evidently practical for letters, and could be used for other minor weighings in the house, such as spice-weighing or medicine weighing, yeast weighing or for weighing citric acid, (as the author has done in the past.)

Was the discrepancy due to the more rigorous weeding-out of duplicate ideas by the French Patent Office? This is contradicted by the evidence of the patents themselves. So many French pendulums were accepted which were basically the same, and varied only in artistry or proportion that the officers either did not care or did not check previous patents to see if the idea had already been patented. The British patent office was equally relaxed about passing scales on the same principle as others already patented, so the difference in numbers cannot be attributed to the vigilance of the French Patent Office.

Was it because there was a small market for postal scales in France? If one estimates the number of French postal scales made by counting those that have survived in French collections one must conclude that very few postal scales were made. Unless there is a secret hoard of postal scales hidden away, any British collector would be amazed by the rarity of the postal scale in France.

This evidence is totally contradicted by the numbers of French postal scales surviving in Britain. Judging by the large number of Narcisse Briais' scales marketted in Britain during the 19th century, Briais had a very competitive pricing policy. Was this because Briais had a very healthy home market and were manufacturing in large numbers? Was he successful due to a favourable

PATENTEES

3,608....LABORDE Denise Lucile....50,Rue des Sg du Temple, Paris...21.7.1846

7,700....SUSSE Michel Victor.....31,Place de la Bousse, Paris.....30.12.1848

7,804....VALETTE fils (mecanicien)12,Passage Jouffroy, Paris.....30.1.1849

7,874....GUERIN Rene.....66,Rue des Parais du Temple, Paris.9.3.1849

20,623...FAUVEL Louis Alexandre...8,Rue Aumarre, Paris.....12.10.1854

28,419...BRIAIS Narcisse Eugene (mecanicien)
Rue de Calais, Bellville, Siene..28.10.1856

30,375...MANCHET Jules Auxene (inventeur).....2.3.1857

39,495...MONCHICOURT the elder Desire Valentine.....14.1.1859

40,264...FREY Gustave (mecanicien).Petites .?.d'Austerlitz, Strasbourg
5.5.1859

47,727...THIEBAUD A & BURDET.....Lyon.....12.12.1860

54,144...MICHALET Edina Marie & DUPAS Henry Gervais....Paris.....12.6.1862

59,246...HALL Nathaniel Richard.....Londres.....12.8.1863

64,178...BRIAIS Victor.....13.10.1864

72,478...BRIAIS Narcisse Eugene.....5.10.1866

73,126...WEBER Jules Henri.....Paris.....22.11.1866

171,632..RESTORF 13.1.1886

256,884..GILFILLAN Errington Nuell.....11.9.1896

273,669..READ Robert Hamilton.....31.12.1897

424,557..ALBINET Jean & AUDOUIN Jean.....Gironde.....17.5.1911

427,026..GNUCHTEL .....?

455,511..RUHLAND .....?

550,654..TELESNITSKY Vsevolod.....17,Rue Claude-Bernard, Paris,5...15.3.1923

Fig.3

rate of exchange? Was he selling well because the British had a passion for fashionable French accoutrements?

Were there fewer French patents because French manufacturers were not as adventurous as the British? This was certainly not the case in the field of scientific instrument making. The French were respected for their inventions, their accuracy, their effective publicity, their good delivery times and for the high quality of their instruments. They did not kill the British trade, but they made life much harder for the British in the 19th century. Their great aptitude would lead one to expect other trades to have numerous and varied patents.

Was it because it was too expensive to take out a patent in France? This had been the case in Britain during the 17th and 18th century, and had had a very deleterious effect on trade. Plagiarism was rife, and most manufacturers could not afford either a patent or recourse to the law when their ideas were copied. Possibly this affected submissions in France. Yet when one looks at the trade specified by each patentee, many French patentees were not mecaniciens (makers), and their names do not appear in the lists of scale makers published so far by the Societe Metric de France, in their magazine, or in the lists in Lavagne's book 'Balanciers Etalonneurs.' They may have been makers, but it seems likely that they were private individuals taking out a patent on their own initiative, and that suggests that it was not a very expensive business to take out a patent.

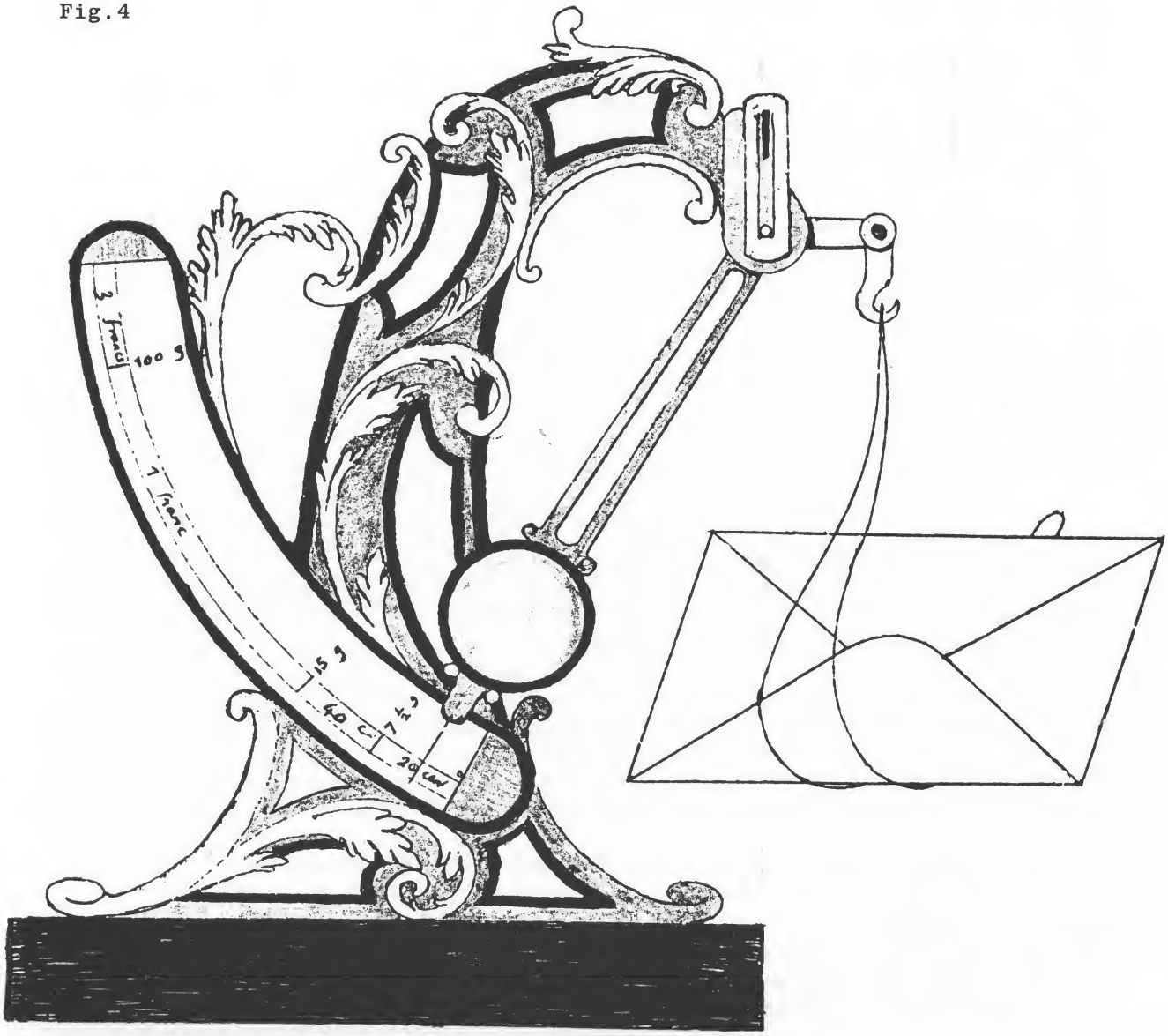
It would be most interesting to know how many patents resulted in a new scale's being manufactured. We know the approximate number in Britain from Michael Crawforth's work on Patent Postals,(pages 398 onwards, at the back of every issue of EQM until page 708.) So little has been published on French postals that it would be invidious to make comparisons.

One very marked difference between the scales patented in France and those in Britain concerns the cost of producing a patented scale. The French patented proportionally more of the expensive and middling cost scales. The British patented many more cheap scales. Admittedly, not all the cheap British scales were manufactured, but enough were made to show that there was a big demand in Britain for cheap scales. (Fig. 2.)

Although the British occasionally attempted to patent all-embracing designs that would have caused any future patentee endless trouble, generally the patentee had to be specific and patent only one object. In France, however, several alternative ideas appeared on one page of drawings, which, if protected, would have precluded all new ideas for the next ten to fifteen years. Susse was particularly comprehensive in his attempts to cover every principle of weighing, and Narcisse Briais tried to cover all candlestick possibilities.

One effect of these multiple applications was that, when looking at the principles of design used by each country, there were 36 principles to look at, but only 22 patents, in the French section. In the British section there were 96 principles and 96 patents, so that one could say that there were not three times as many patents in Britain but over four times as many patents and much research needs to be done in France to explain this anomaly.

Fig.4



French patent no 3608, applied for 12 Jan. 1846, granted 21 July 1849, to Demoiselle LABORDE, Denise Lucile, 50, Rue des Sg du Temple, Paris for a balance with a lever without weights for letters. This patent presents problems to the researcher, because the number of the patent, 3608, puts this patent before no. 7700 of 1848, but the hand-written date on the document is 12 janvier 1849 and the postal rates were introduced in 1849, ie, 20 cents up to 7 g, 40 cents up to 15g, 1 franc up to 100g and 3 francs for more than 100g. as can be seen on the drawing, Fig. 4. Above the central pivot there appears to be a swinging indicator to show that the balance is properly vertical when in use. Never seen .

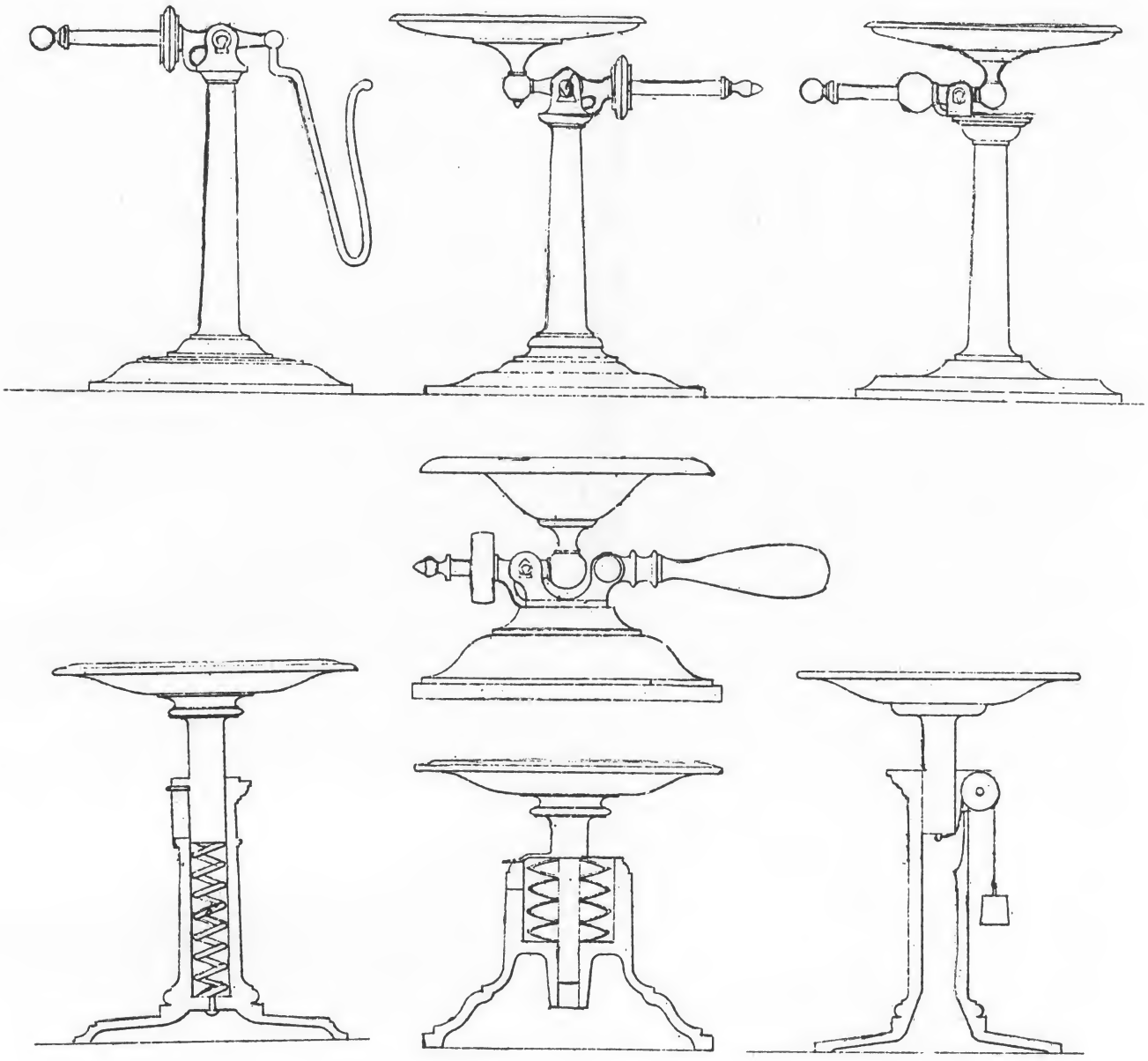


Fig.5

French patent no. 7700, applied for 13 Nov. 1848, granted 30 Dec. 1848, to Michel Victor SUSSE, negt., (patent agent,) 31, Place de la Bousse, Paris. This patent is the most outrageous attempt to patent five principles at once, four steelyards, a candlestick with a compression spring, a candlestick with a tension spring, a candlestick with a cord and weight & a candlestick with a letter plate floating on hydraulic fluid. The pan on the fourth steelyard is very deep for a letter plate and was probably designed for some other product. It would be interesting to know for whom the agent was patenting these designs. Never seen.

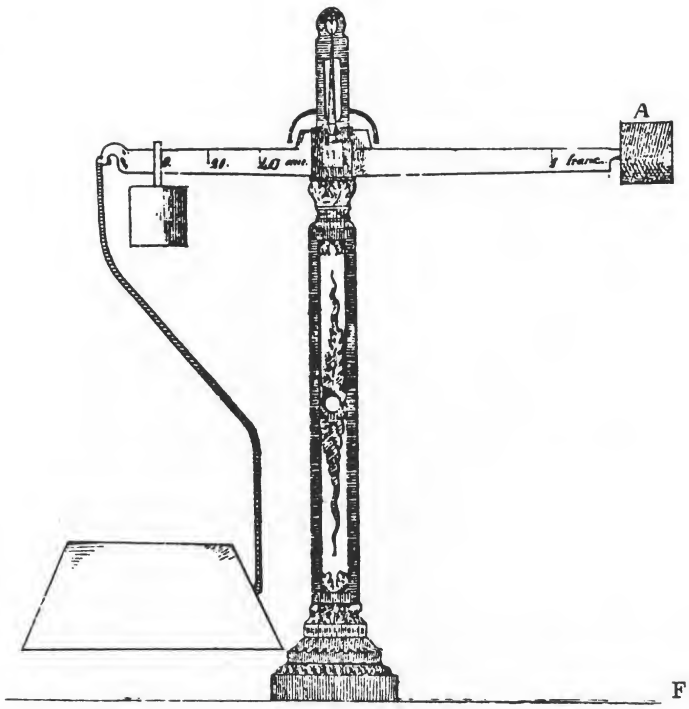


Fig.6

French patent no. 7804, granted 30 Jan. 1849 to VALETTE fils, mecanicien, (makers,) 12, Passage Jouffroy, Paris, for a letter scale. This steelyard has two weights, one each side of the central pivot, and it is possible that the user had to put the weight 'A' on when a heavy letter up to 100g was to be weighed. The balance looks rather unstable with such a small base.Never seen.

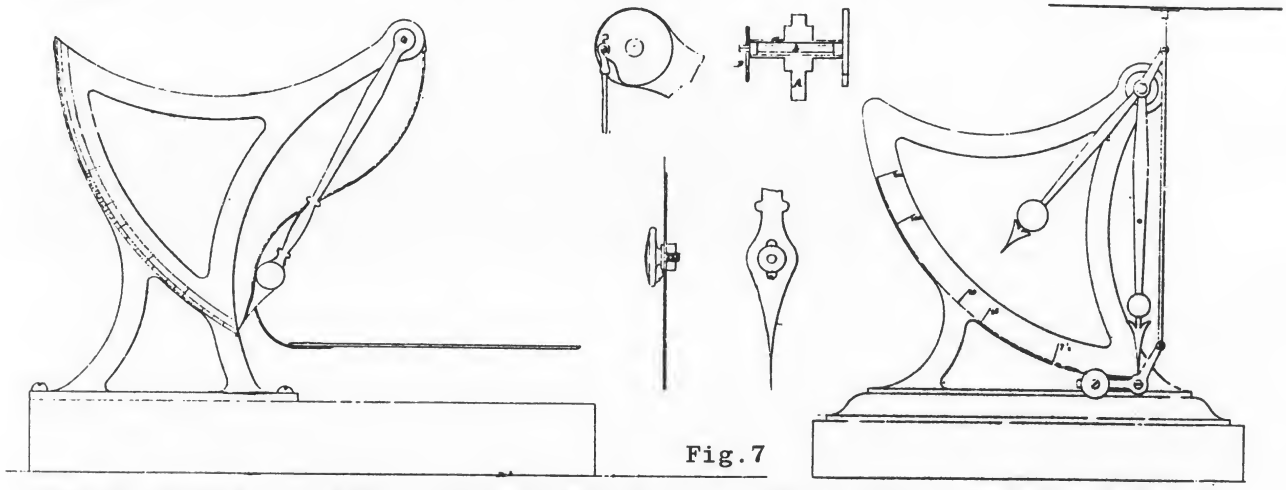


Fig.7

French patent no. 7874, applied for 15 Jan. 1849, granted 9 March 1849, to Rene GUERIN, 66, rue des Parais du Temple, Paris. The first pendulum balance is a conventional one on exactly the same principle as no. 3608, above. The second pendulum is a bit odd, appearing to have two pointers, but I think that the higher 'pointer' is in reality a weight on an arm made in the shape of a pointer but not intended to be used as a pointer. At the bottom of the parallelogram, to the left is an additional weight, helping to offset the weight of the letter plate. I do not know why 20g is marked on the graduation plate, as there was no letter rate cut off at 20g in 1849. Never seen.

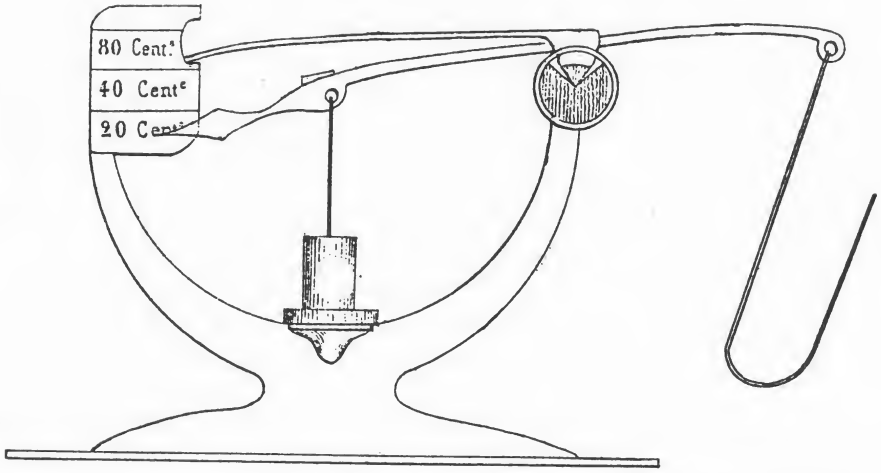


Fig.8

French patent no. 20623, granted 12 Oct. 1854, to Louis Alexandre FAUVEL 8, rue Aumarre, Paris. The four previous balances were probably stimulated by the first universal letter rates within France, and this balance was probably stimulated by the change in rates in 1854, although the rate drawn on to the graduation plate was not the one adopted ;- the drawing shows 40 cents as the second rate, whereas the rate adopted was 50 cents. The hanging weight is the simplest form of pendulum and lacks the graceful lines of the previous pendulum. Never seen.

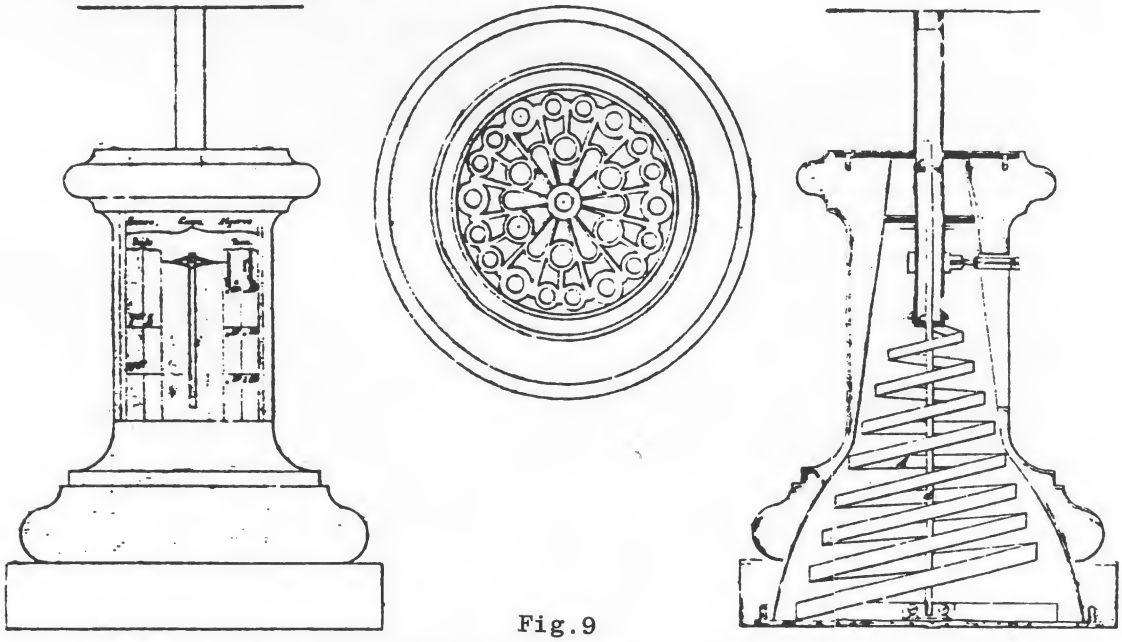


Fig.9

French patent no. 28419, applied for 10 July 1856, granted 28 Oct. 1856, to Narcissé Eugene BRIAIS, mecanicien, (makers) rue de Calais, Belleville, Seine for a letter scale. This chunky candlestick had a wooden outer casing concealing an unusual tapering spring, and a base pierced by an ornate pattern only seen when the scale was turned upside down. The example seen had an ebony case and was stamped 'N Briais'. Usually Briais only put NB on his scales, and this use of his whole name was extremely rare. Fig.10 shows the

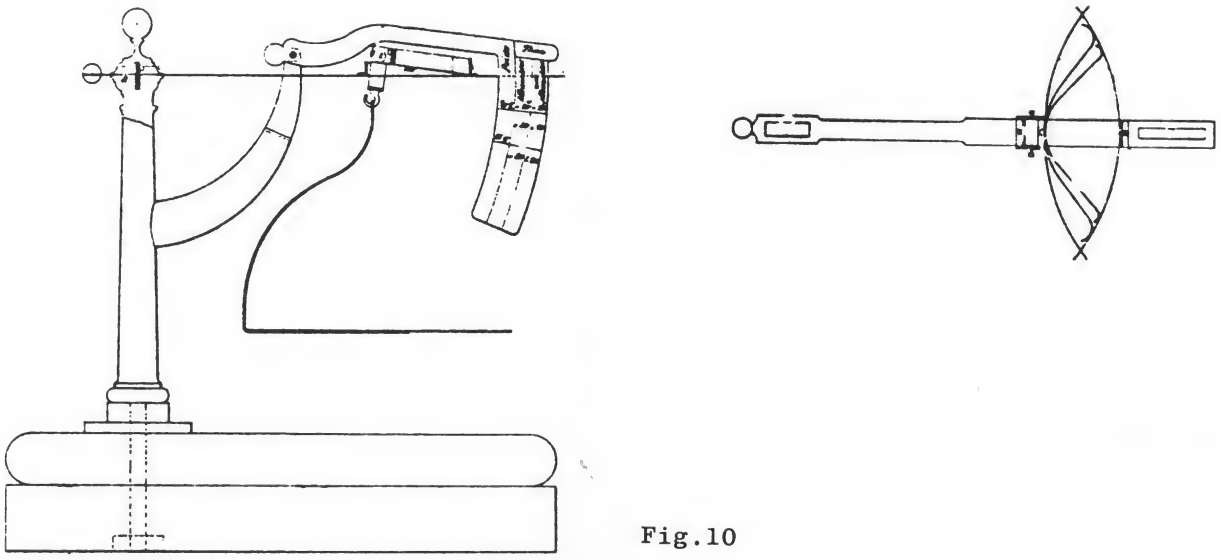


Fig.10

second scale on the patent, and is very difficult to interpret. The letter hanger is attached to a flexure spring, so when a letter weighs down the spring, the end of the spring points to the appropriate place on the graduation plate on the right. There appears to be a set of additional springs in a bow fixed to the top of the flexure beam, which would prevent jarring by the application of the load. It is difficult to believe that a letter would jar the fixing of the hanger to the extent that preventive measures would be needed and two leaf springs seem to be an extrordinarily elaborate way to solve the problem. Never seen.

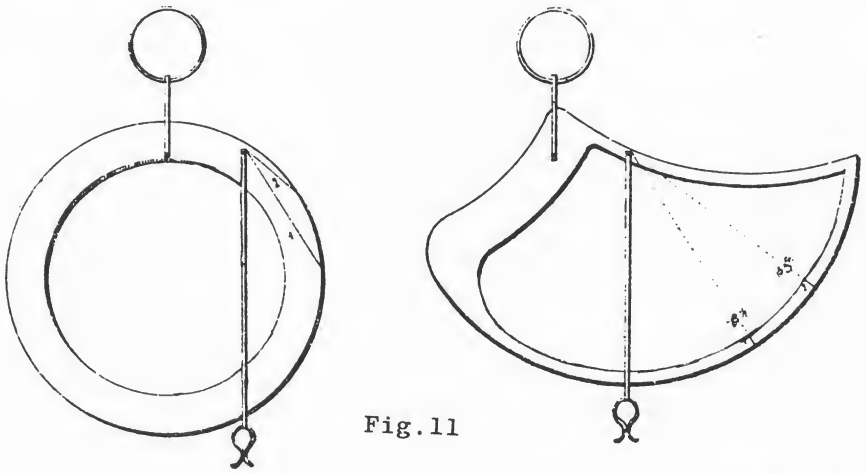


Fig.11

French patent no. 30375, applied for 2 Jan. 1857, granted 2 March 1857, to Jules Auxene MANCHET freres, inventor of Yonne, for a letter scale. Both pendulums would work satisfactorily, although the small marks on the graduation arc would be a bit difficult to read. Never seen.

With thanks to Lou uit den Boogaard for his assistance with the French postal rates.

To be continued.

Pre-1700 England Part 3 by D F CRAWFORTH

The middle of Samuel Neale's life was politically lively, to say the least. Charles I made life so intolerable for the Parliamentarians that they executed him and had a Commonwealth instead of a Monarchy from 1649 until 1659. Fig. 1 is a box from later in his working life, which shows a precursor of the trade label. His name and address were written in gold ink on the flap over the weights in the lid. It stated 'Samuell Neale Scale-maker at the Hammer and Crown in St. Ann's Lane near Alldersgate Lodon (sic.)' with 1682 below, between two scrolls. The shears were not as long as half the beam, the pendant is smaller and finer than his earlier ones, the pointer is not pierced and he lined the bottom of the box with green plush (hand cut velvet.) The beam looks so very 18th century that one is tempted to say 'A replacement," but it is not a replacement;- he had changed his style to make round section beams and he stamped his initials on the beam twice, just to help future historians?! Coin weight experts may speculate as to which weights went in this unusually capacious box, assuming that the round sockets were for the usual eleven coins. Were the square sockets for pennyweights and Troy weights? An exceptionally interesting set, by a man who left us a rich legacy of material about himself and who trained Joseph Hart, whose widow trained John Neale who.....

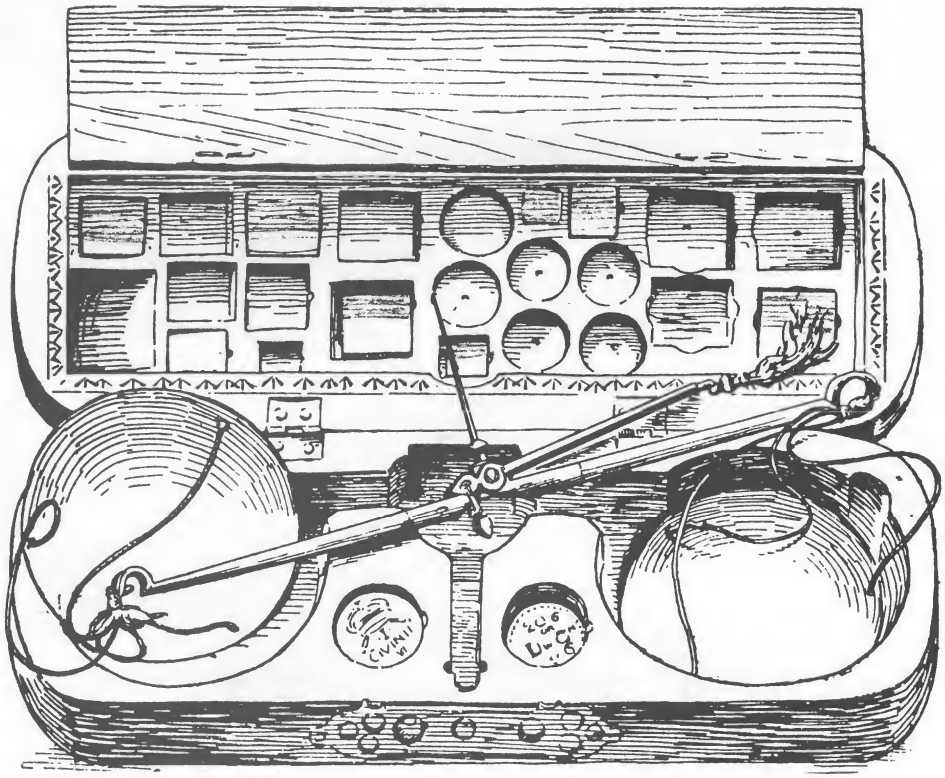


Fig. 1 . Another rare, exceptionally large set for twelve or more coins, and for square weights, probably for apothecary and Troy weights, and for grain weights. No other set is recorded as having black and gold embossed decoration on the diaper design, nor as having a black painted panel with the name and address written in gold on it.

Fig. 2 . One of many stone weights which have survived. As usual, it was never stamped by an inspector. It weighed 30lb. Avoirdupois;- this might have been a 28lb. load with 2lb. added as an allowance for the weight of, say, a sack. It was marked XXX. The loop went down a hole in the centre and was leaded into position.

Primitive stone weights with an iron ring leaded into the top have survived in surprisingly large numbers;- perhaps they have had so many uses since, as door stops, cheese presses, tethers for grazing goats, etc, that people were loath to throw them away. They were commonly chipped with their weight in pounds, in Roman numerals;- XIIII, VIII, XXX, etc. They were not verified usually and cannot be dated, but they must not be forgotten as part of the weighing scene.

We have no information on the dates that Thomas Snow lived,(Fig. 3)so we must be guided by the internal evidence. This beautiful little (13 inch, 32 cm.) steelyard has a dome to prevent the loose weight from falling off, which is an early feature. He has engraved it with 'C lb.' to indicate the capacity, meaning not one hundred pounds literally but a hundredweight, or cwt. of 112 lbs. We have seen so few of these steelyards from the 17th century that one cannot be categorical, but I include it as probably being made before 1700.

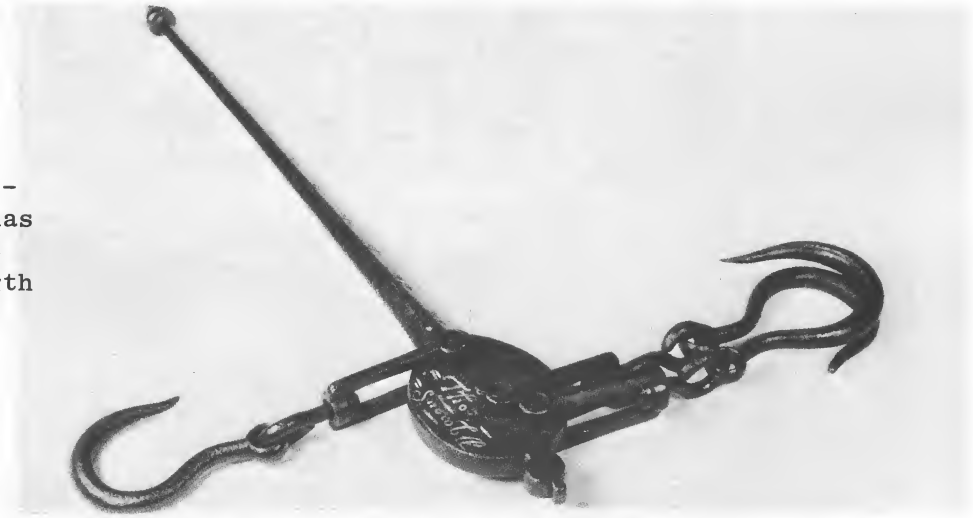


Fig.3..Trade steelyard, made by Thomas Snow. To weigh 112 pounds. Iron. Length 13 inches (320mm.)

The little steelyard in the Avery museum was made entirely of brass so was differently constructed. Because it was stamped IP 1686, and also William Waddy, we do not know which of them made it but at least we know when it was made! The only design feature that it has in common with the previous one is the dome to prevent the weight slipping off. Later steelyards had a flat plate rivetted on to the end of the beam. The flat plate holding the three pivot points is more a characteristic of brass steelyards than an early feature.

Fig.4..Trade steel-yard made of brass. Made either by IP or by William Waddy, in 1686.

John Harris stated on his trade label that he made steelyards, (stillards,) but we have never seen one. A very few coin scales have survived, fortunately, giving us an idea of his working practice. He had a shop facing,(over against,) St. Margaret Patton's Church in the narrow lane called Rood Lane, which was used by people coming into London from the North-east who wanted to go down to Billingsgate Fish-market or dock. The sign swinging outside his shop was a Sun and Scales, either painted on a board or modelled in three dimensions. He sold big beams, scales (that means pans, probably of wood as well as brass,) weights and steelyards, so must have had blacksmithing skills, and

Fig.5..Coin scale made by John Harris who was working 1690 & died in 1699.

if he really did make weights, casting skills. The little beam in the coin scale box was cast then filed down, polished and chiselled with decorative lines. The style of the beam is early- square section iron for the middle part, a plain curved cut away under the central pivot and a flat pointer with a hole drilled in it .If one had the box without the evidence of the weights, one would probably say '1680s', but the nesting weights for silver coins, five shillings, two and sixpence, one shilling and, lastly, for a sixpence, V,XXX,XII,VI, the smallest three being expressed as pennies worth, show that this set was bought by somebody who was worrying about the incredibly worn and damaged silver coins in circulation, a worry particularly prevalent in the 1690s and early 1700s. As John Harris died in 1699, we

must assume that the scales were made during the last ten years of his working life. The scruple weight in the grain locker is a later addition, but the pistole weight might have been in the box when it was sold. (For more detailed information on the coin weights before 1700, see the articles by Norman Biggs in EQM between pages 877 and 1043.)

Fig.7..Coin scale made by Henry Neale, who worked 1686 until at least 1695.

Henry Neale lived in a more prosperous part of London, a bare ten minutes walk to the north-west of John Harris' shop, in a corner site facing the Royal Exchange and just round the corner from the Bank of England. He must have done a lot of trade in coin scales, and this is born out by the number that have survived. The minor variations are fascinating, showing that he did not stick to one design. He varied the size, the beam design, the box lay-out, the ornamentation of the book-stamps, the catch's engineering, the design of his label and whether or not he put his stamp of the hammer and crown in the pans. (Yes, he used the same sign as Samuel Neale, but the records of Blacksmiths' Co. are missing for the period when he was trained, so we can only guess as to their relationship.) He allowed the same amount of space for weights throughout his working life, which is not surprising, as the coins to be checked between 1686, when he started, and 1707, when he finished, were the four gold coins, the guinea and the half guinea and the pistole and half pistole. The grain locker was made large enough to take grains and four flat weights to check the silver coins mentioned above. Some time after 1695 he moved to another shop in the other important scale making area of London, St. Ann's Lane, a fifteen minute walk to the west, to be near Goldsmiths' Hall and the great meat market of West Smithfield.

Fig.8.& 9..
Exterior and interior of coin scale by John Neale,working 1691 until at least 1739.

There are several other scale makers whose work has survived from the 1690s. Their work was very like that done by John Harris and Henry Neale, and the main difference to the casual eye was the lively trade labels.

Fig.9

Fig.10..Coin scale made by Thomas & Elizabeth Hux . This label was designed for Elizabeth's husband, also called Thomas, before his death in 1687. It was altered firstly for Elizabeth to use, and then for her and her son, Thomas, to use after she finished training him in 1704.

James Tallman's scales conform to the generalisations in previous paragraphs except that he had adopted the new fashion of using hooks to fasten his boxes. Possibly he started to do this after 1700, as he did not die until 1717, but I wanted to draw your attention to his trade label, which was collected by Samuel Pepys before 1703, and which illustrated his stock. The steelyard would still have looked contemporary to a man in 1900, with the familiar bulge balancing the mass of the beam, the turn-over hooks and the turned pointers indicating horizontality. The nesting weights with their flat topped lid was already standard English design, and would continue in use for another two hundred years. The stacking flat weights were a little flatter than we are accustomed to, but wholly recognisable as English. The object on the top right hand side has not been identified, but Michael and I played with the idea that it was an early form of spring balance. If a load on the hook pulled the rod down the middle, it would distort the ogee curved flat springs at the top, and the weight would be read off on marks on the central rod as they passed the frame.

Can anyone come up with a better idea?

Fig.11

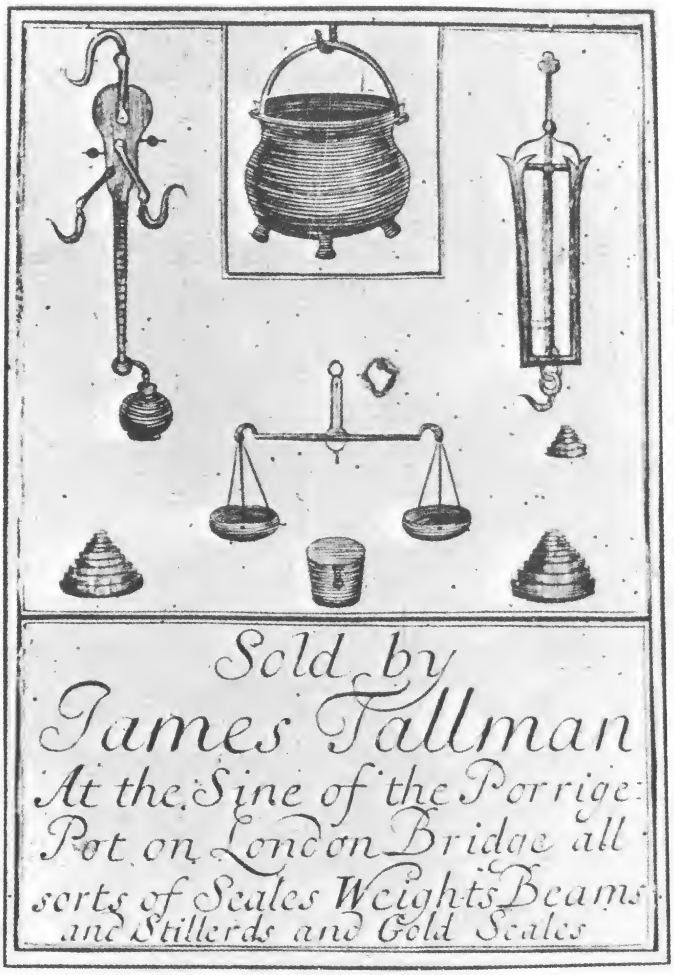


Fig.12..Trade card collected by Sam. Pepys before his death in 1703. James Tallman had an excellent site for his shop, and he died worth £1037 in 1716, a huge sum at that time. The possible spring balance is very similar to the spring balance patented by Bergman and Slack in 1889!

This talk was given at the meeting in Leicester in May 1989. It was intended to help collectors with early English material to identify items made before 1700, but not intended to give a comprehensive view of the scale making trade It would be wonderful to do that, but information is so patchy at present that it would take a brave man to attempt it!

Material was gathered from, particularly, Robin Connor's book published by the Science Museum, from which place Connor obtained many of his illustrations. A visit to their Weights and Measures exhibition in the Physics Section is a most rewarding experience for anyone interested in early material.

Thanks must be given to the Science Museum for the use of illustrations of scales photographed when they were in the Welcome Collection.
Thanks also to the British Museum for the use of the Tallman trade card. This is one of many trade cards of interest to ISASC members, held in the Prints and Drawings Collection.
Thanks also to Goldsmiths' Hall, the London Museum, the Avery Historical Museum, the Museum of London and many private collectors who generously allowed us to examine their early scales and weights.

ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

1990—ISSUE NO. 4 PAGES 1385-1412

PAGE 1386

Cover Picture

Owned by Betty Wright.

This delectable silver postal pendulum carried Hall's patent to its most decorative extreme. The weight only was indicated, so we cannot date the scale by the postal rates. The scale was not hall-marked, so we cannot date it that way. The maker did not put his mark on it, so we cannot get a period within which it was made. So, we are reduced to contemplation of the scale alone, with its superb flowing lines, deeply cut detail, exquisite feathering and subtle use of the basic shape. The playful way it was decorated makes me think of other scales made in the United States, especially silver ones, and I would like to think that this one also is American.

Review

By G BATZ

Inventaire des Poids, (Inventory of Weights) 1989, Musée National des Techniques, Conservatoire National des Arts et Metiers, (CNAM,) Paris, 1990. Self-published. ISBN 2-90-8207-06-0. Format 24x18 cm (9x7 ins.) 146 pp, 249 photos including 5 colour, French francs 75, plus postage (North America about 45 FF.)

This inventory/catalogue of weights in the CNAM National Technical Museum of France comes soon after a successful exhibition and book of the same name, 'L'Aventure du Mètre' about the revolution in weights and measures that started in 1793. It updates the inventory last published in 1941.

The reviewer has to overcome the feelings of deja-vu. It is easy here. The 1941 catalogue is little known; it was only apparently larger in that it had 29 chapters, on weights, measures and weighing devices, while the 1989 version deals only with the weights, in three chapters. This is done with 231 excellent photographs (1941- only 15); on 112 pages (1941- only 42) and listing 338 weights or groups of weights (1941- only 186.)

INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

Founded September, 1976

111 North Canal Street • Chicago, Illinois 60606 • U.S.A.

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In the foreword, the Director of CNAM has given ample praise of the part played by Aimé Pommier, secretary of the Société Mètrique de France, our sister organisation. In fact, he is one of the two reasons why this book was written. It is his 'indefatigable, ardent and patient' work that chiefly brought it about. The other is the historic bond that the Museum has with Metrology.

This catalogue, the first of a series of catalogues of the museum's 44,000 objects, is divided into two main part: Weights of France and Other Countries. Almost èqual space of some 30 pages each goes to the pre-1793 weights and also to the 'new' ones, dividing the latter into three periods: metric before and after 1840, and the transitional weights known as 'usuel' (1812-1839) when people in France were once more allowed to use the old names for the new tongue-twisting kilogrammes, myriagrammes and hectogrammes. Then follow weights from 17 other countries, on 49 pages.

Every shape can be found, including nesting weights, coin weights, apothecaries and jewellers' weights, weights of wood, (yes, wood,) glass and brass, iron and steel, platinum and bronze. French pyramids, Chinese violins and English bottles are followed by stacked and knobbed weights, hexagonal, odd and other shapes, not forgetting the pride of French metrology, the famous Pile de Charlemagne made about 1500, weighing 25 pounds, as well as some 30 distinctive City weights, among them the crocodile and palm of Nimes of demins fame.

Photography is excellent throughout. In fact one can clearly see the inscription on an 18th century set for which there is an almost identical counterpart at the Deutsches Museum in Munich. The same artist-engraver worked with the wrong data to place on the 4 loth weight. He inscribed 16 348 (Richtpfennigs) instead of 16 384. The Munich set was afterwards given an 'engraved correction.'

Each weight or set is catalogued by at least 8 descriptive entries. This is painstaking work, given the fact that museums often do not know what they receive by way of gifts. They usually come without 'easily followed instructions.' Enter the metrology expert Aimé Pommier and a 'young and motivated team.' They have done a great job. Denomination, time frame, country and maker, if known, material, shape, dimensions, provenance and year of accession and precise description for each of the 338 entries.

Some work seems to have been left for the next edition, but this version must take us into the next century. There are two weights (253 and 271,) surprisingly similar in shape, each stamped with eagle and 1(771), one for the Cologne mark of Augsburg, the other for the Vienna mark, but they are recorded to have been made in different cities. Coincidences? Lack of coordination?

Altogether, a most worthwhile source of so much data on the weights and systems of many nations. Lack of French will be no bar to your enjoyment of this book. This reviewer never had a French lesson.

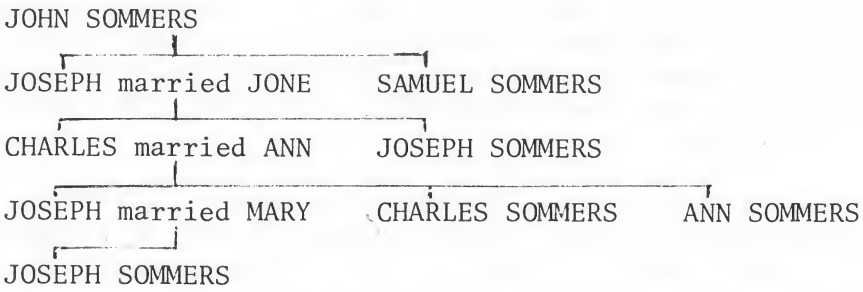
Aimé Pommier has graciously undertaken to fill orders from US ISASC members. Write to Secretariat SmF, rue d'Odessa F-75014 PARIS France. Send the equivalent of 120 francs in US dollars (and add a little for the fluctuating exchange rate- or we will leave Aimé paying part of the price out of his own pocket.)

For an additional 80 FF you may order L'Aventure du Mètre.

Sommers Scalemakers

By D F CRAWFORTH

John Sommers, free Citizen of London, respected member of Skinners' Company, living in Holborn had two sons, Joseph and Samuel born in about 1706. By the time the boys were fourteen, he had arranged for the boys to be apprenticed.



Joseph and Samuel both went to live with John Picard at the Hand and Scales at the corner of Maiden Lane (now Gresham Street) and Wood Street, a mile nearer the City centre than their childhood home, and in the crowded little lanes of old London. They were only a stone's throw from the ancient Guildhall and the Goldsmiths Company's Hall, where gold coins were checked annually. John Picard had promised to train the two boys to be scalemakers, and they, in their turn, had promised to behave properly, to be obedient, not to get drunk or gamble, and not to reveal their masters' secrets. They shared the house with John Picard, Ann Picard and the two older apprentices for the next four years, possibly having to put up with the beginnings of John Picard's mania that was eventually to lead to his incarceration in Bedlam Hospital for the Insane. They must have known many other scalemaker's apprentices living within a hundred yards of "their" shop, and they must have watched many barrows, handcarts and waggons bringing trade weights to be verified at the Guildhall.

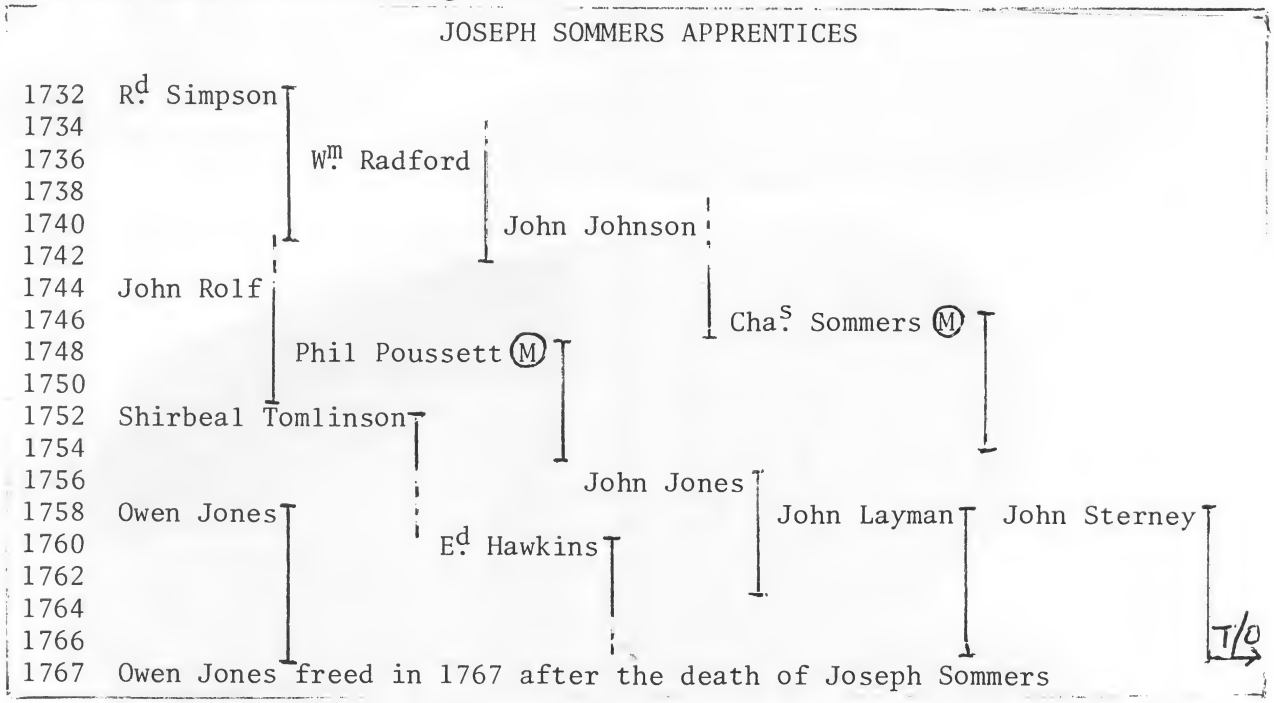
Joseph and Samuel were taught to cast small iron beams, to file and polish the iron, to drill holes with great precision in the iron, to adjust the scale pans to match in weight and to tie the silk cords accurately so that the pans hung level and at equal distance from the beam. They learned to cast brass for coin weights and nesting weights. They learned how to order suitable boxes - solid wood cut away for high quality beams, more fragile shagreen (a new fashion) over plywood padded with silk and velvet for the very superior person, simple oak for the economical - how to order trade labels, how to mix the smelly animal glue and keep it warm and runny without burning, how to keep the books and how to strike a bargain with customers trading-in their old scales to buy new ones. In short, within seven years they had to be fully competent to run a business themselves.

Their fellow apprentices reached this stage and were taken along to Blacksmiths' Company Hall to be freed, and then attended Blacksmiths' Courts about four times a year, but Joseph and Samuel remained, working as journeymen for John Picard until they were about 24, and then they joined their father

as members of Skinner's Company. This was another prestigious Company, much respected in the City, but it did not give Joseph and Samuel that inestimable advantage;- an old boy's network. They could not have a quiet word in a relaxed atmosphere with other scalemakers, and they did not get easy access to the latest gossip and ideas for new products.

We do not know what happened to Samuel after this, but we do know that Joseph married Jone in 1731, had a first son Charles in 1732 and a second son Joseph in 1734. He got on well with his elder son, Charles, taking him as an apprentice and having him freed in Skinner's Company in 1754.

We have no evidence as to where Joseph and Samuel earned their living between 1731 and 1758, but we know that Joseph either worked for himself, or worked for somebody with a large workshop, big enough to accommodate a journeyman who had his own apprentices. It is highly probable that Joseph worked for himself. He was unusual in taking a totally untrained beginner as his first apprentice (usually the first apprentice was at least half trained, and could help his inexperienced master) but he soon had two apprentices and went on to have three for much of his working life.



By 1758 Joseph Sommers had a shop on the corner of Bucklersbury and Walbrook, facing the Mansion House, an excellent position to have a scalemaker's shop, near the financial centre of the City, the Bank of England and the Royal Exchange, very close to the markets in Poultry and Cheapside and on a direct route between the ferry at Dowgate Wharf and the centre of the City. He had a card printed 'I Sommers, Scalemaker at the Corner of Bucklersbury against ye West Side of ye Mansion House, Maketh and Selleth all sorts of Scales and Steelyards, Likewise Selleth all sorts of Weights of Brass, Lead and Iron..." with a table of coin weights for Portuguese Pieces, Moidores, Guineas and Pistoles. He was unusual in his emphasis on his provision of weights of brass, lead and iron, giving us a clue that he did a lot of casting himself, of both little weights for coins

and of big weights for shopkeepers. He even had his own initials stamped on his weights, a rare event by that time, and an indication that he took responsibility for the quality of the weights.

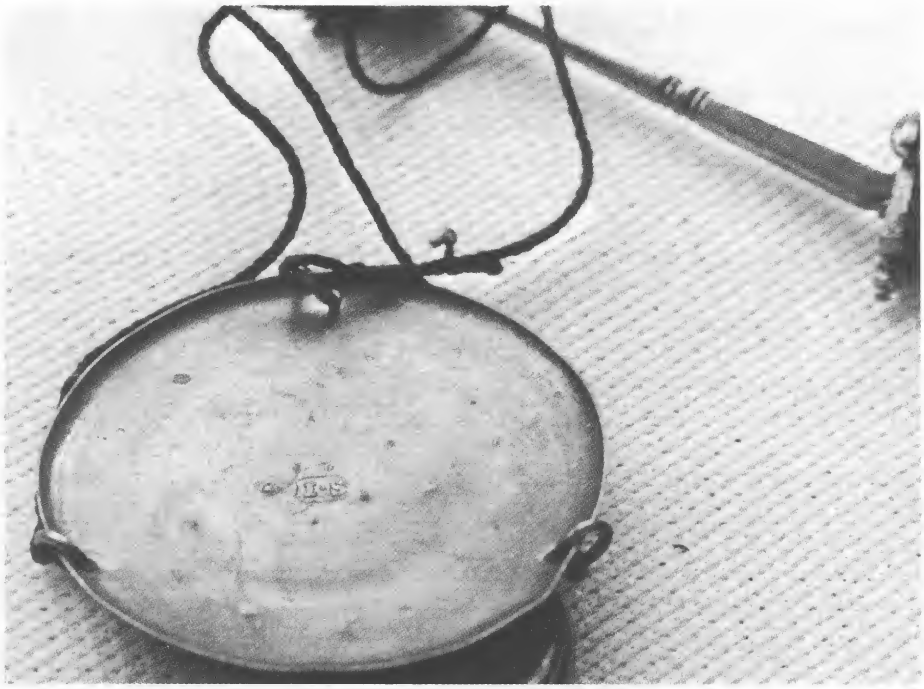


Fig.1 Scale pan by Ioseph Sommers:- IS.

Fig.2 Coin scale in a shagreen case, lined with velvet throughout. The weights include the quarter guinea, only made in 1762, but these weights were made after the death of Jos. Sommers, as they were made to the 1774 Standard.

Only two coin scales are recorded by Joseph Sommers, one in Ipswich Museum, a shagreen-cased one, with his initials stamped in the pans, and one seen in an antique shop, in a cut-from-solid wood case with a label stuck in the lid. As he had three apprentices most of his life, he probably had nine journeymen working alongside him in the shop, working on scales that would be sold under Joseph Sommers' label. This implies a big output of scales and weights, and we must regret the loss of so much of his work.

Joseph Sommers worked at the shop on the corner of Bucklersbury and Walbrook all his working life, so far as we know, but by 1763 he had another property south of the river, very easily reached by going down Walbrook, down Dowgate Hill past his own Guild's Hall and on to the Dowgate Wharf. He could be rowed across the Thames very easily as the Wharf was far enough up-river from London Bridge not to be badly affected by the tedious rebuilding of the bridge. The bridge had been the only thoroughfare into London for the people living south and east of London for hundreds of years, but the buildings along each side of the bridge made it impossibly congested, and Joseph Sommers must have been as pleased as any Londoner that the new bridge was going up wider than the old bridge, and he could watch its progress as he was rowed home. He had a two minute walk to the pleasant residential area next to the Bear Gardens, which had been a pleasure gardens for Londoners with shaded walks, side-shows, food stalls and drinking kiosks. Presumably he lived in that attractive area rather than living over the noisy shop in Walbrook, and he relied on his elder son Charles to mind the business.

Charles had gone his own way after he was freed in 1754. By 1757 he had his own shop in the valley to the west of St. Paul's Cathedral 'near the Fleet Ditch', another one up the hill, further from the City, 'at the Hand and Scales near St. Dunstan's Church in Fleet Street' and a third one, between the other two, 'next Anderton's Coffee House in Fleet Street', but we do not know the dates or the sequence of his use of these shops. He kept a shop in Fleet Street until at least 1773, even though he was back at his father's shop near the Mansion House by 1765, presumably running it on his father's behalf until his father died in 1767.

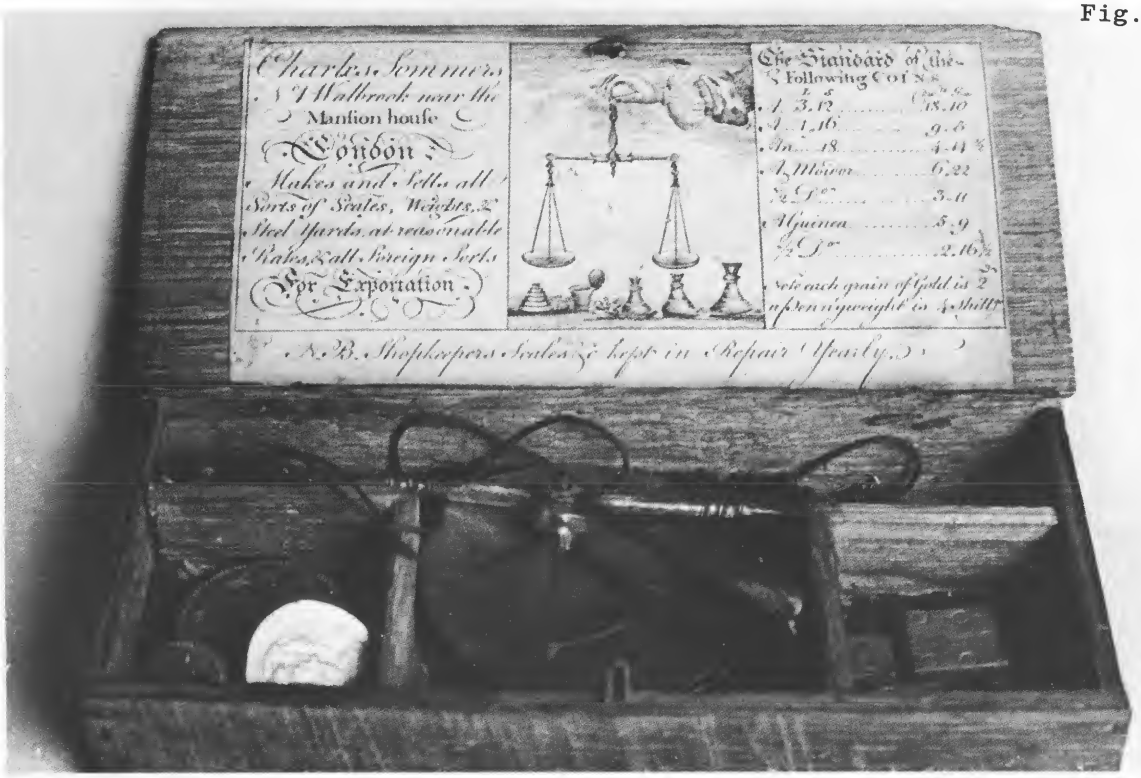
We know a great deal more about the products that Charles made than we know about his father's scales. His father had a trade card with only his address on it, and only a very few coin scales have survived, containing his coin weights stamped IS. Charles, however, was much more helpful to future historians, as shown in the next seven paragraphs. As he was trained by his father, we may assume that Joseph made approximately comparable range to that of his son Charles, although the scales that would sell in the financial centre round Walbrook might be different from the ones that would sell in the smart and highly fashionable area of Fleet Street.

Charles Sommers' coin scales have survived in some numbers. He made simple little beams with swan-neck ends, but with the refinement of two fine collars round each arm, a collar round the base of the pointer and a gracefully shaped shears head. Such coin scales would not have been the cheapest coin scales, costing about four shillings when sold in an oak box with the seven weights mentioned on the label. Probably the other four coins current in Britain were also catered for- the nine shilling piece, the 4/6, the 6/9, and the 5/3, as


Charles Sommers,
At the Hand and Scales
Near St. Dunstan's Church Fleet Street.
London
Makes & Sells all Sorts of Scales, Wights & Sterlyards,
FOR FOREIGN USE
Scales with their respective Weights or Coins, as Spanish and
Portugal Gold Coin, Barbadoes Virginia & all ye West India
Silver Currency. Turky Venice & Guiney Scales & Weights
Diamond and Assay Scales and all other Sorts
For Exportation at Reasonable Rates
N. B. Shopkeepers Scales, &c. kept in Repair Yearly
Charles Sommers Faiseur de Balances
A L'Enseigne de la Main et des Balances proche de
l'Eglise de St. Dunstan dans Fleet Street a Londres.
Fait et vend toutes Sortes de Balances et de Poids
pour le Transport aux prix les plus raisonables

was normal in coin scale boxes. Charles stated,'Makes and Sells all Sorts of Scales...and Steelyards at reasonable Rates' implying that he made large beams for trade use, beams made by the blacksmiths skills. Was Charles himself a muscular blacksmith, working in a shop echoing with the resounding clash of hammering? He stated, 'Makes and Sells Weights' and illustrated flat stacking weights, nesting weights and large trade bell weights, which would all have been cast from bronze/brass and requiring precision and expertize on the part of the caster. His reference to 'all foreign sorts for exportation' would allude to the weights he could supply with his scales.

Fig.3



This is confirmed by his trade card of 1773 which stated 'Charles Sommers Makes and Sells all Sorts of Scales, Weights and Steelyards FOR FOREIGN USE. Scales with their respective Weights or Coins, as Spanish and Portugal Gold Coin, Barbados, Virginia and all of West India Silver Currency, Turky, Venice and Guiney Scales and Weights, Diamond and Assay Scales and all other Sorts for Exportation at Reasonable Rates....'

Diamond scales were fine, hand-held beams with a block chiselled with square sockets to take square (inverted trunkated pyramidal) weights for 32, 16, 8, 4, 2 and 1 carat, and a hole for the fractional weights. This block was glued in to the corner of a box with cut-off corners, the box having a long slot in its base to hold tweezers/shovel, used to manipulate the tiny weights as well as the diamonds.

Assay balances were larger, perhaps 7-12 inches (20-30 cms.) long, supported by a stand or pillar which screwed into the box, and were used by explorers, geologists and scientists (to use modern terminology,) or philosophers, as they were then called.

Fig.4

Annual maintenance contracts may seem to be a modern practice, but look at the last line of Charles Sommers trade card, 'Shopkeepers Scales etc Kept in Repair Yearly' and this was before the days of Trading Standards Officers, Weights and Measures Inspectors and Acts of Fair Trading. The shopkeepers conscience was his guide, and he followed the biblical admonitions.

To progress to other scales made by Charles Sommers, he also made fine sets for his wealthier customers, sold in boxes covered with the black, granulated finish of leather made from the skin of the dog shark, called shagreen. The leather was glued over hand-built plywood, usually five layers thick, and the lining was velvet glued into the base, and a silk pad glued into the lid. The pens were cardboard covered with silk and when Charles sold it to a customer, it looked very handsome with its textured black leather, glossy green silk, gleaming brass and mirror-finish iron. The glue was the weak point in all these boxes;- the label normally fell off, the plywood loosened and warped and the shagreen lifted within two generations of owners, so that modern collectors get a false impression of these previously beautiful scales.

One set of coin scales that has retained its immaculate appearance is shown in Fig. 6 . Each weight had a knob so that it could be located in a separate pen and not rub its neighbour, and yet was lifted out easily. The grain weights had their own pen along the centre front of the box, and did not need to be kept in a twist of paper, as were the grain weights in most shagreen cases. The exposed edge of the base was concealed under a silver woven ribbon so that the edge did not wear through to the cardboard. The £3"12 (double Johannis) was mentioned on the label, but no weight was provided for it, probably because most users had no contact with that enormous gold coin, and the

Fig.5

weight was rarely needed. The beam was beautifully made, but was not the most elaborate type made at that time- Charles Sommers did not provide a sight-hole shears as Freeman and New would have done,- but who would complain about that when confronted by such a lovely set, knowing that neighbours would gasp with admiration when it was opened up for use?

Charles had a new trade-label printed when Parliament enacted a decree in 1774 that old and worn coins were to be melted down to make new guinea coins, and only the less damaged and worn coins were to circulate at strictly controlled values until 1776, then from 1776 onwards only guineas weighing over 5dwt. 8 grains were to circulate. Charles, like almost all coin scale makers of his time, stopped making sets to weigh all the foreign coins, and made scales only for English coins. He was definitely master at no. 1 Walbrook since the death of Joseph in 1767;- and in fact, may have been master since 1763, if his father had fully retired. He was being helped by his son, Joseph, one of the twins born to his wife Ann in 1752, as he was training Joseph.

Joseph did not take his freedom in Skinners' Company until 1781, and then Joseph had problems two years later with Blacksmiths' Company, as that company tried to get him to take his freedom in Blacksmiths' Company, on the grounds that he was a scalemaker. Joseph had every right to be a member of Skinners' Company by patrimony and could not be compelled to join Blacksmiths, however logical it would have been to have all the members of one trade working in London to be under the control of one Guild Court.

1781 was a momentous year for the Sommers family. Charles took into partnership the widow of Thomas Gibson. They moved the contents of the Sommers' workshop and home into 111, Wood Street, where Thomas Gibson had traded. They gave up the Walbrook shop, and they settled down to live in the same area that Charles' father Joseph had lived in when he trained with John Picard, sixty years earlier. The area was still the main place that people went to when they wanted to buy scales. After two years in Wood Street Mrs. Gibson faded from the scene. Was she pensioned off? Did she remarry yet again? Did she die? Perhaps she retired to the country, having money left by her late husbands, Thomas Brooksby and Thomas Gibson.

Charles took his son Joseph into full partnership in 1784, and they continued to produce fine scales. As usual it tends to be the coin scales that have survived, too small to be worth selling for scrap, but small enough to tuck into the back of a drawer. Charles and Joseph continued to make 'All kinds of scales, weights and steelyards for Diamonds, Assays, Gold Coins or Silver Currency' which sounds very conventional. Fortunately one unusual scale has survived in Banbury's little museum.

The Mayor of Banbury in 1796 was responsible for the smooth running of the huge livestock market held weekly in the small town, and he ordered new scales and accoutrements from London, sixty five miles away. A six foot high wooden tripod has survived, that originally supported an equal-arm beam 4-5 feet (1 metre 20-50 cms.) long probably used to check sacks of grain, large weights or general goods. The brass fitting at the junction of the wooden legs was inscribed

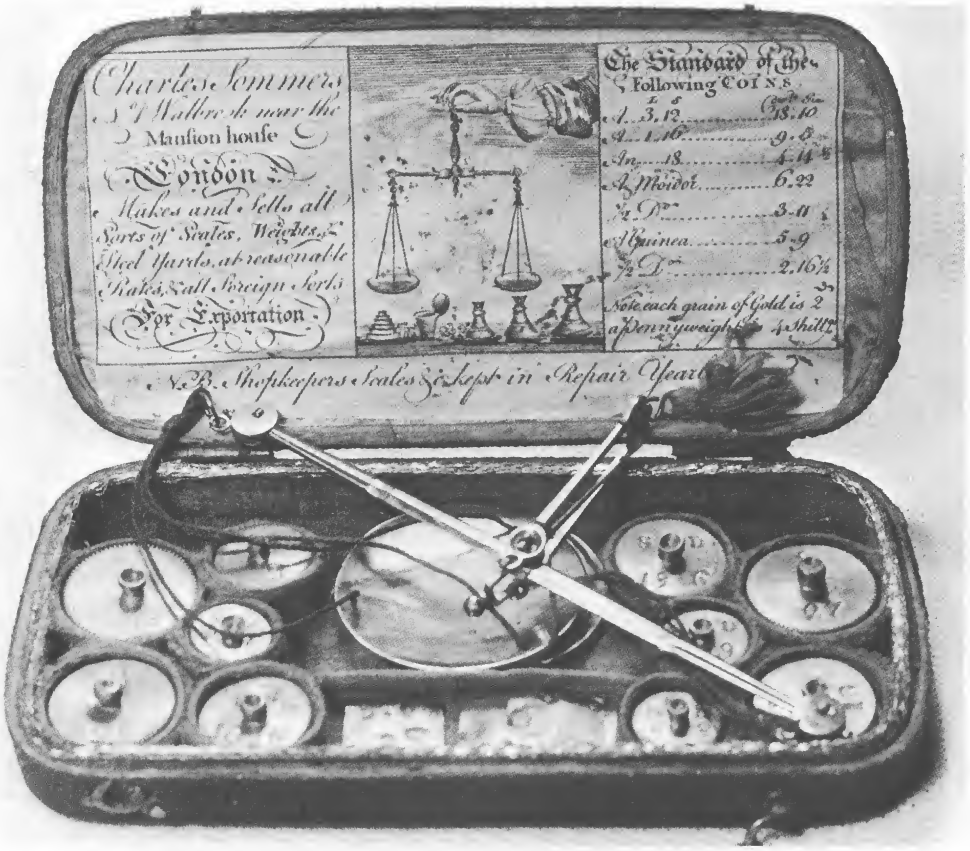


Fig.6

'Sommers and Son, London, Revd Robt Spillman! The smaller beam which survived had a 10 inch (25 cms.) beam made of iron, with octagonal and round sections, with large 8 inch (20 cms.) diameter brass pans handsomely engraved, 'Revd Robt Spillman Mayor + Sommers and Son, London + Banbury 1796.' The beam hung from an iron pillar with tripod feet and a lever lift which raised the pans off the table and allowed weighing to commence. This beam and pillar were handsomely decorated with gold on the black paint, and can justifiably be called an inspectors' beam as it was the size used to check trade weights. So, although Sommers and Son only specifically mention diamond, assay and coin scales, they obviously were, as stated, making 'all kinds of scales!

Fig.7

In parenthesis, the design of the various Sommers' trade cards mentioned in this article show an interesting progression through the century, reflecting the change in fashion common to virtually all scalemakers and instrument makers. Joseph Sommers senior's tradecard was one panel, containing words only. Charles Sommers' earliest tradecard showed his shop sign in a cartouche in the centre at the top Page 1392 and two delightful little Chinese style pagodas on each side of it, reflecting the passion for chinoiserie during the middle of the eighteenth century. The cartouche at the bottom of the card illustrated a busy warehouse with a book-keeper watching a man weighing a sack, an illustration typical of the mid-eighteenth century. The repetition of the main facts in French at the very bottom was more common earlier in the century, when there was more trade with France;- and French pistoles were in common usage. Only one other maker has been noted using French to attract his customers so late on in the century, and he died in 1766, so we might deduce that this tradecard was printed very shortly after Charles Sommers was freed, in 1754.

Fig. Compare this tradecard with that in Fig. and Fig. Note the way 'steel yard' is broken into two words, giving a false impression that the word derives from a length measure made of steel.

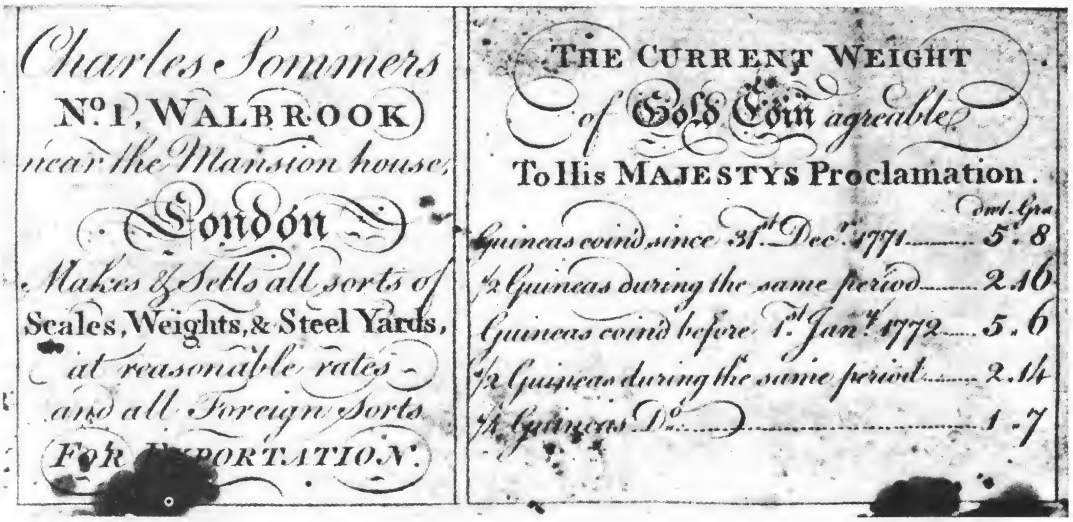


Fig.8

Charles Sommers next known tradecard was printed for him when he was early on at no. 1,Walbrook, The shop must have been numbered after the legislation of 1767 prohibited the use of swinging shop signs outside the premises within the City of London. The coins in circulation were the ones familiar to people in the late 1760s and early 1770s, and the division of the card into three panels was typical of those years' fashions. Charles still reminded his customers that his sign had been at the Hand and Scales, and possibly he had the sign still screwed to the front of his shop, (but not hung on a bracket where it could be wrenched off by high winds to fall on an innocent customer.)

Charles Sommers third known tradecard was reduced to two panels when it was superfluous to remind people of his 'Hand and Scales' sign, and he needed to remind them instead of the new regulations, in force between 1774 and 1776, on the minimum weight that a guinea could pass for, without there being an obligation to hand in the light coin for melting down to make new guineas. Most tradecards printed towards the fourth quarter of the century used words only to attract attention, on the assumption that the customers would read all the text, and did not need pictures. We tend to remember the cards of the few scale-makers who still had lively pictures, like John Blackburn, but the Sommers were more fashion conscious and followed trends more closely.

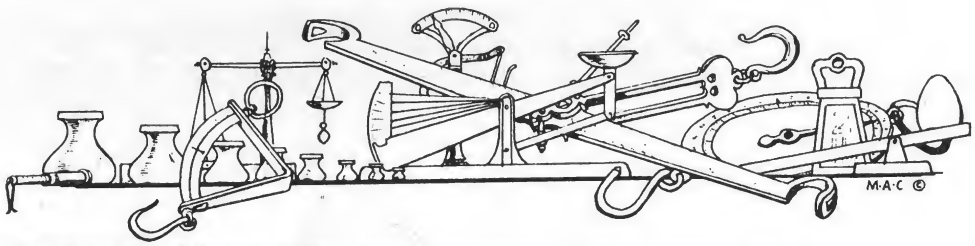
Sommers and Son also followed fashion by having an oval card in the neo-classical style, which started in the late eighteenth century and continued to be popular in the early nineteenth century, again with words only to attract people.

By 1793 Charles was leaving the day-to-day running of the shop at 111, Wood Street to his son Joseph, as he had accepted the post of 'Receiver of City Customs'. Customs dues were paid by both foreign ships and British ships on arrival at the wharfs and quays on the River Thames, and the Receiver must have had a huge team of men collecting the money due to the City. All markets also had Clerks to regulate and maintain good order in the bustling, busy squares and streets

that traditionally were the sites of either specific, (meat, fish, herbs, etc.) or general markets, and each Clerk would have handed over the dues to Charles Sommers. Charles still lived at 111, Wood Street but he must have had an office elsewhere. Charles died in 1807, leaving the business to Joseph.

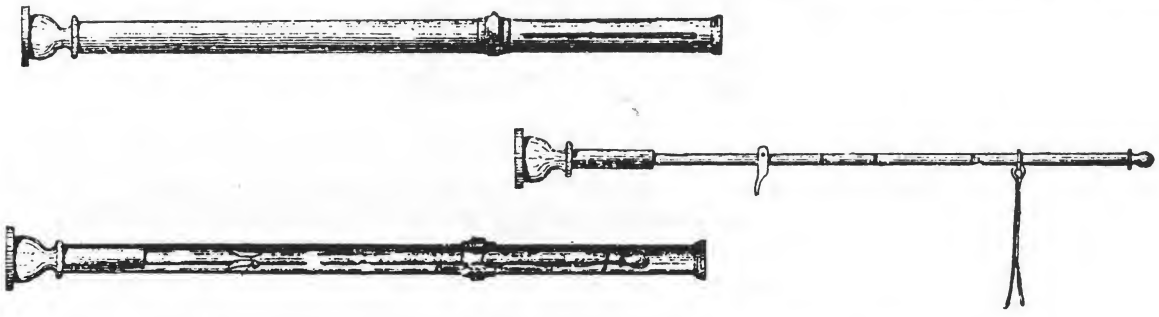
Maybe Joseph was not happy working alone, or maybe he was feeling his age, 55 years, and was preparing for the future but, whatever the reason, he took a partner, N Stanley. What turmoil was caused in the Sommers family when Joseph became a father at the age of 61? Was it broken nights and exhaustion that caused him to retire when his son was only 2 years old? N Stanley ran the business alone from 1816, Joseph died aged 67 in 1819, and little Joseph did not grow up to be a scalemaker like his forbears, so 96 years of traditional scalemaking died out in the Sommers family.

This article was written in response to a request for further information from a descendant of the Sommers. She was kind enough to share with me the information that she had gleaned during her research, and it has been incorporated into this article.

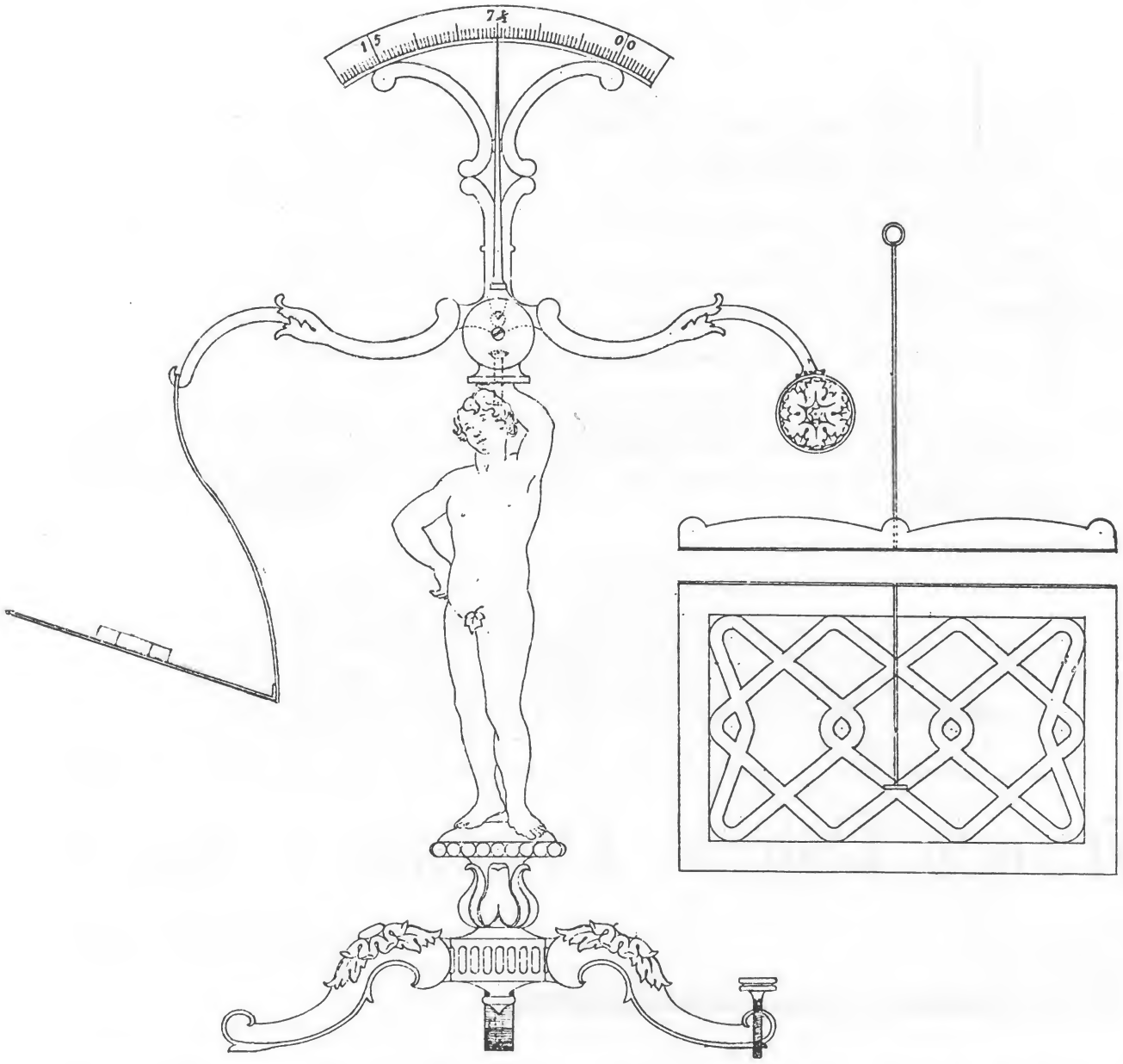


French Patent Postals Part 2

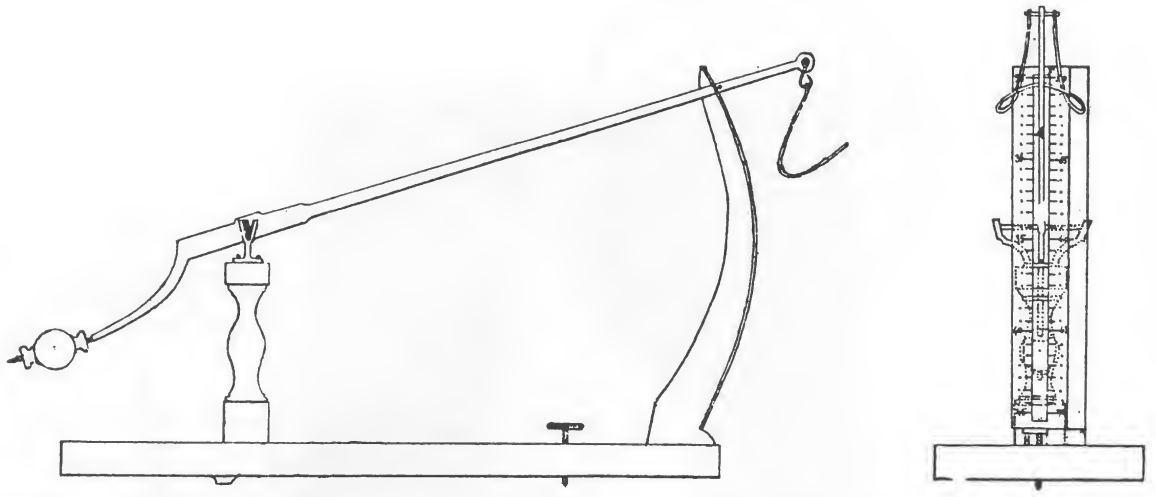
PATENTS RESEARCHED BY H GACON



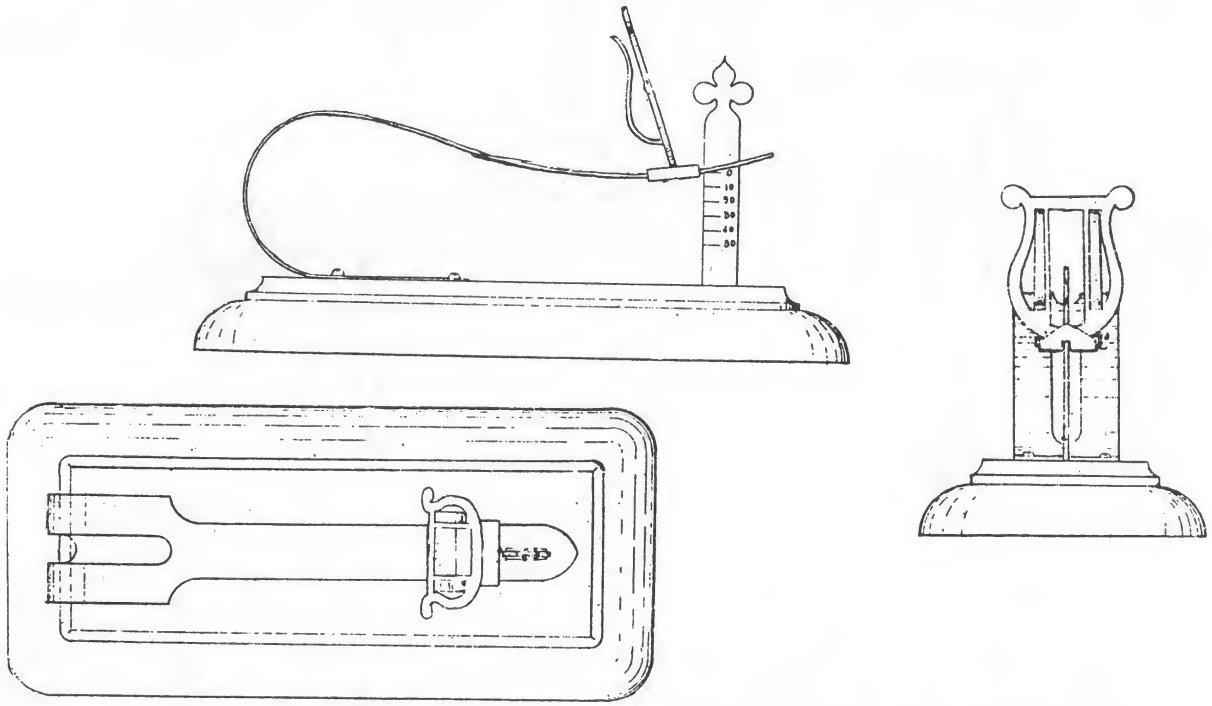
French patent no. 39,495, granted on 14 January 1859, on behalf of Desire Valentine MONCHICOURT the elder. This moving load steelyard is a shelf edge letter scale. The pivot points and the letter clip swing through 90 degrees to slide into the cover, leaving the scale looking like a pencil. The slot in the cover is not understood. Never seen.



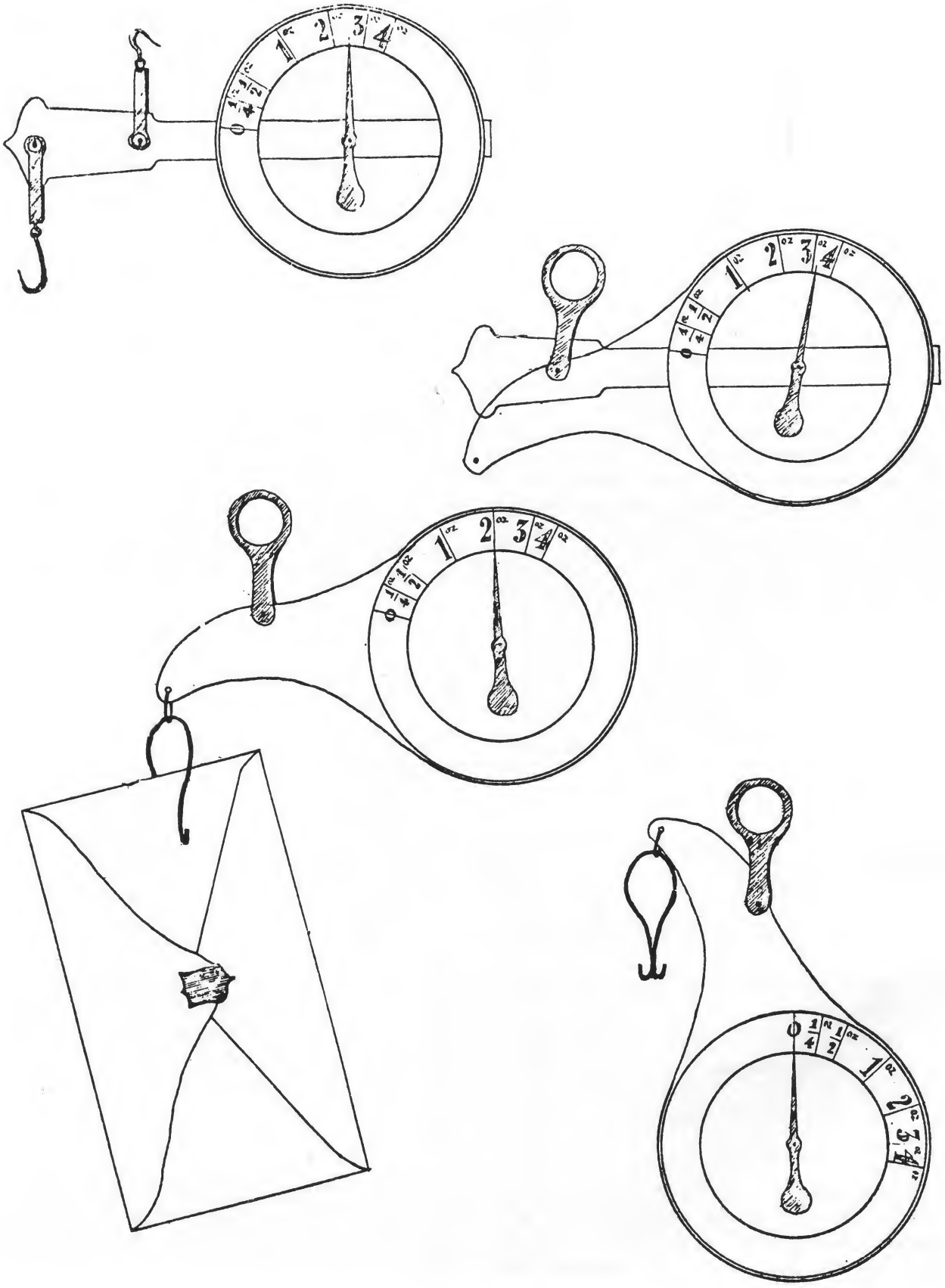
French patent no. 40,264, applied for 19 March 1859, and granted 5 May 1859. to Gustave FREY of the Petite ..... de Austerlitz, Strasbourg, France, for an equal arm letter balance with an ornate curved beam of excessively stable design, the outer pivot points being well below the central pivot point. The pillar was extended upwards to take an arc behind the pointer, with $7\frac{1}{2}$ (grams) in the centre, 15 to the side of the letter plate, and zero to the side of the circular weight, proving that the weight was heavier than the letter plate. The tripod feet were prettily decorated with leaves, and had a screw in one foot to adjust the level of the scale if it was standing on an uneven surface. The pillar was formed by a nude boy observing the decencies with a fig leaf, his hand on his hip, and his other hand holding up the scale. To be made of gilded brass and iron. Never seen.

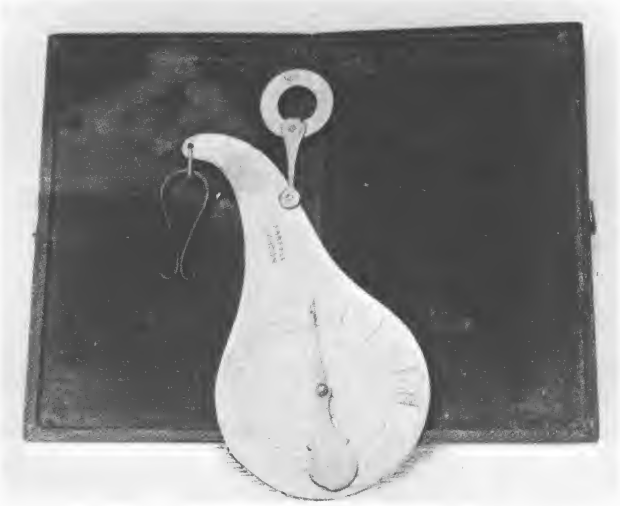


French patent no. 47,727, applied for 12 December 1860, granted 25 February 1861, to THIEBAUD, A, and BURDET of Lyon, France, for an unequal arm steelyard 80 centimetres long! This huge beam was only for weighing letters and was not only impractical in its size, but also in its design principles;- the steelyard was assumed to drop gradually down according to how great the load was, so that the user could read the weight off against the graduation arc near the end of the arm, but the steelyard would be more likely to drop to the bottom of its arc under any load. Never seen.

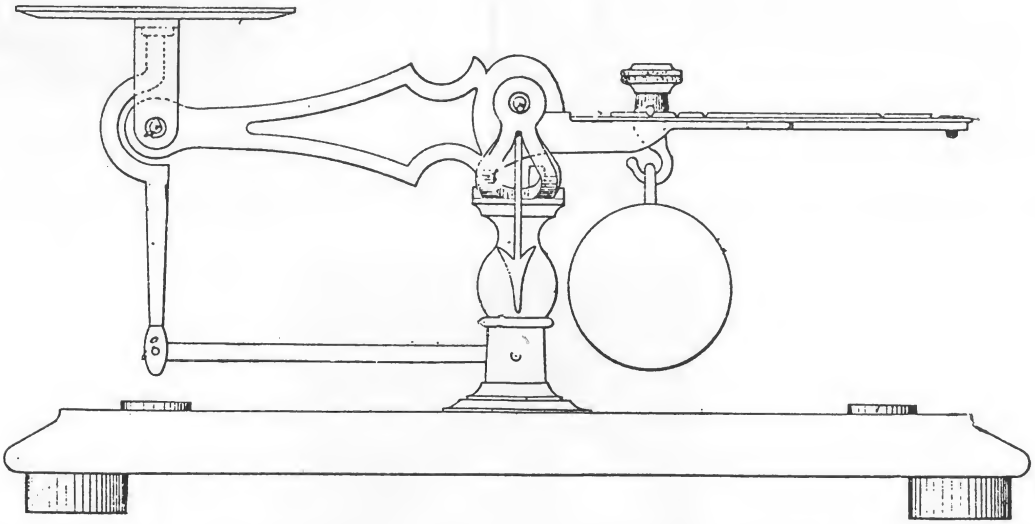


French patent no. 54144, granted 12 June 1862, to Edina Marie MICHALET and Henry Gervais DUPAS of Paris for a flexure spring with a letter clip mounted above the spring. A graduation strip pierced the spring showing the weights of 0, 10, 20, 30, 40 and 50 (grams.) Never seen.



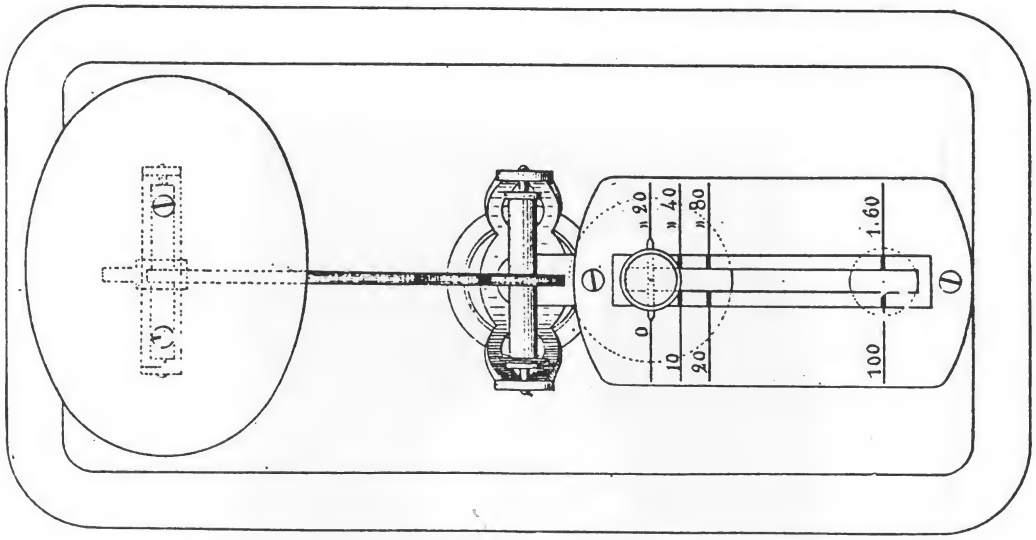


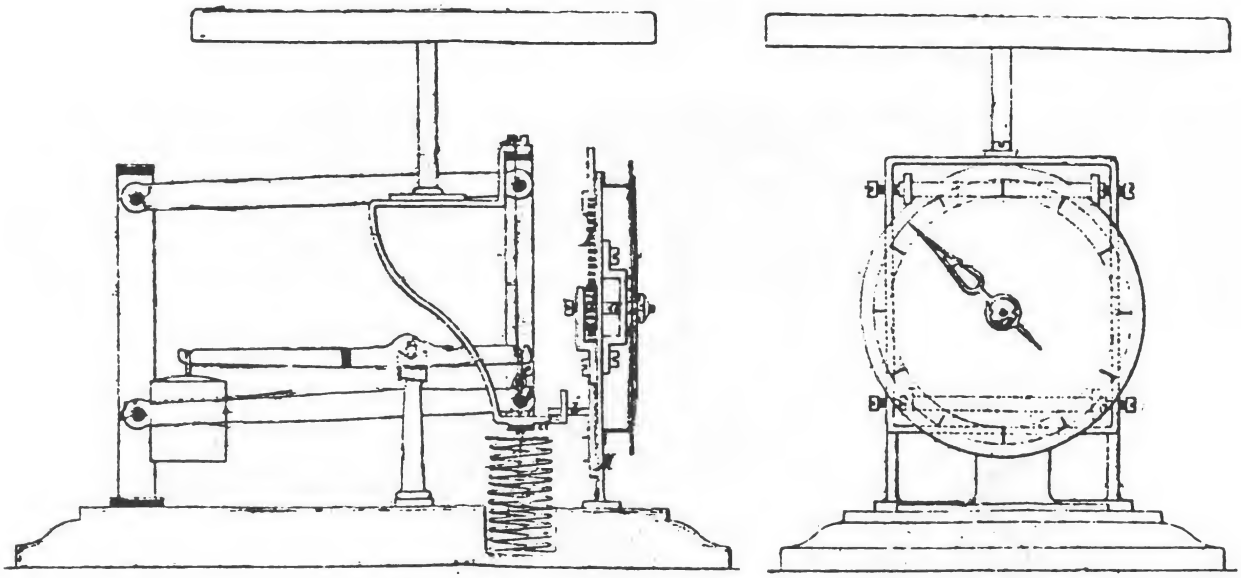
French patent no. 59,246 applied for 2 July 1863, granted on 12 August 1863 to Nathaniel Richard HALL, of Londres, Angleterre for a bent-lever steelyard (or pendulum balance.) The drawings were sent from England and show an English letter weight of $^{1}/_{4}$, $\frac{1}{2}$, 1, 2, 3 and 4 ounces. In fact Nathaniel Hall lived in Northfleet, Kent, and he patented the same balance in Britain in the same year. This patent was highly successful and continued to be made for many years by many manufacturers.

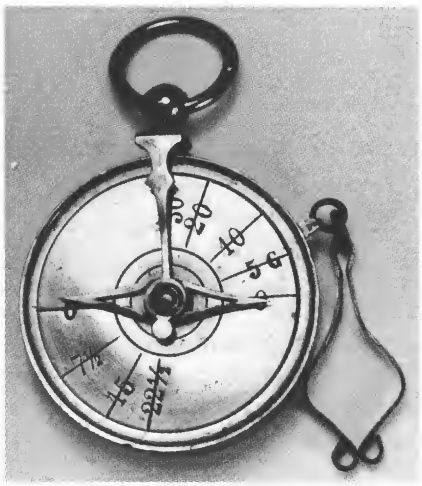


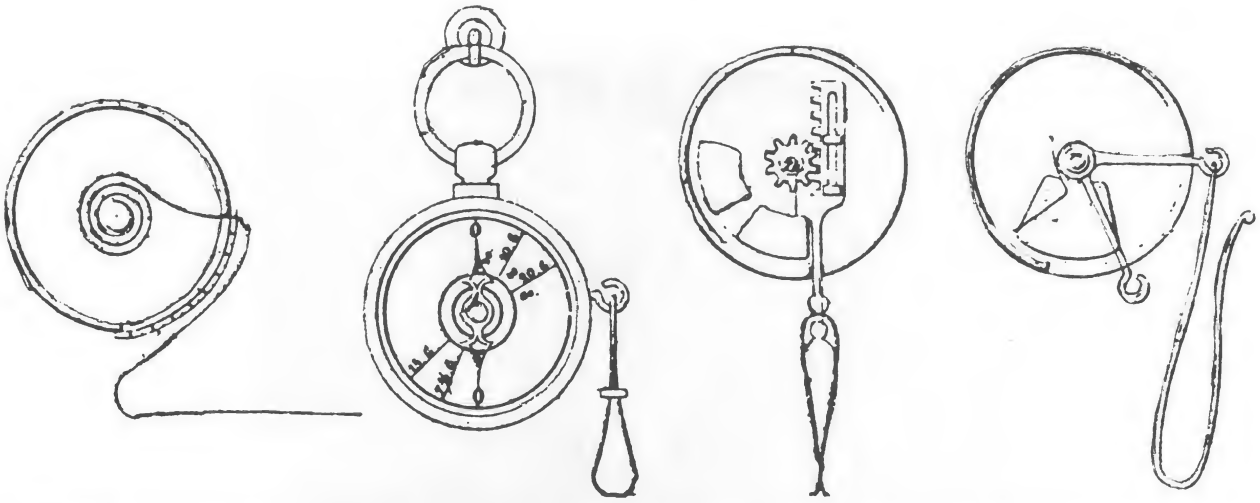
French patent no. 64,178 applied for 21 August 1864, granted 13 October 1864 to Victor BRIAIS for a steelyard with a sliding weight. The beam was pierced in typically French fashion. The letter rates shown were brought in in 1862. The relationship between Victor Briais and Narcisse Briais is not known, but this scale was made by Narcisse Briais, with NB on the plate. A practical desk-top letter scale.

See next drawing>

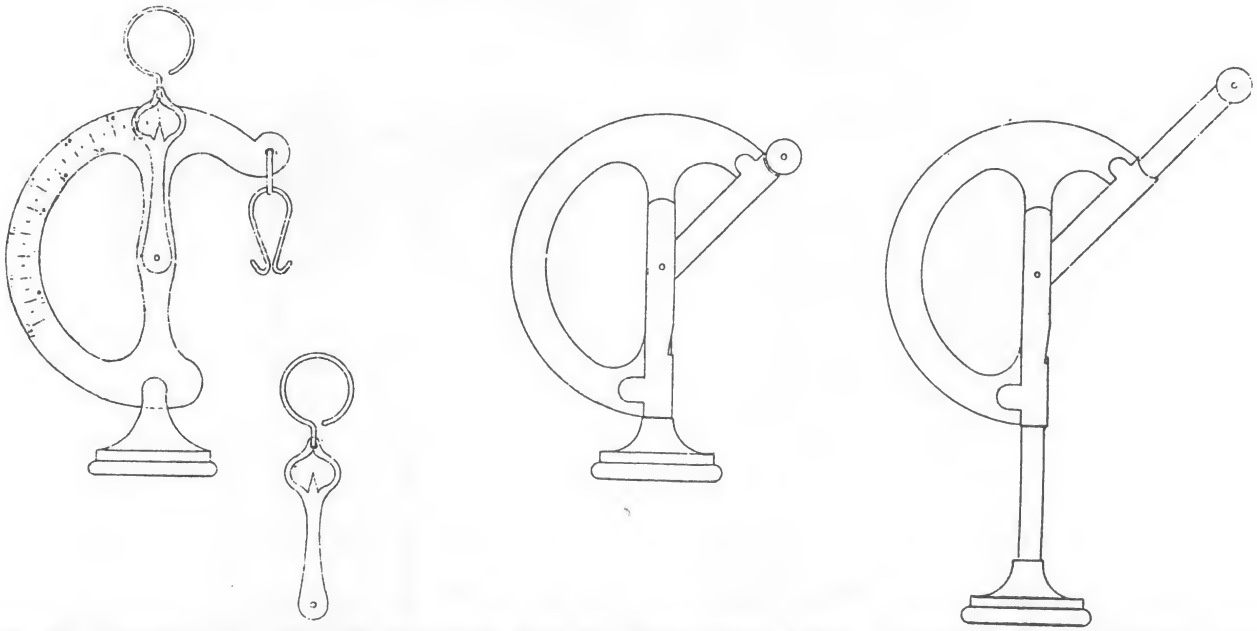

0
10
20
» 20
» 40
» 80
1.60
100



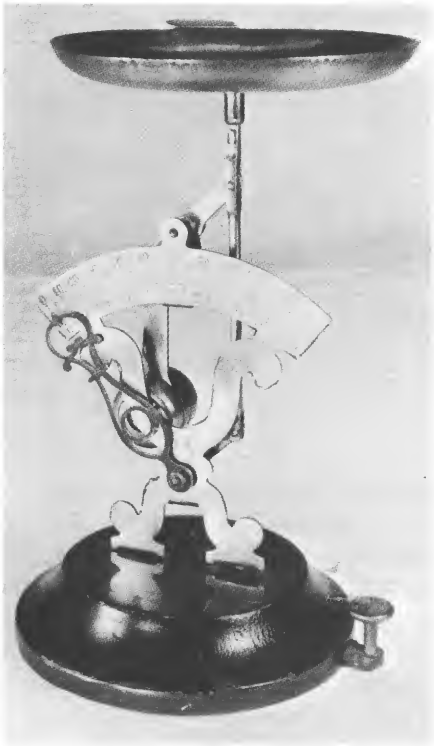


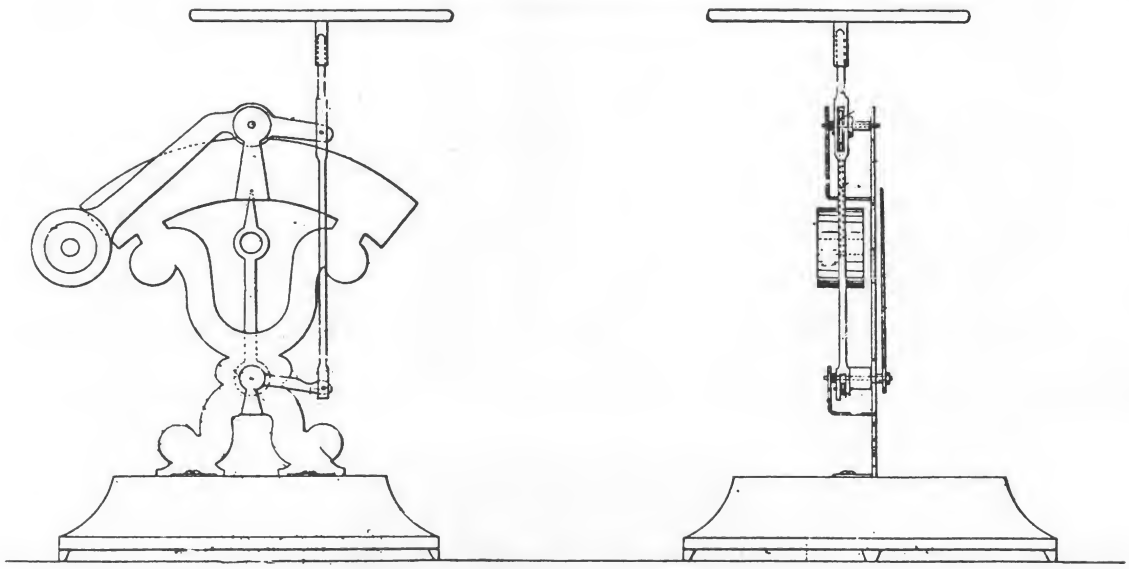


French patent no. 72,478 applied for 2 August 1866, granted 5 October 1866 to Narcisse Eugene BRIAIS for a top-pan spring balance with half-roberval linkage, and for three little circular dials, one with a coil spring attached directly to a letter plate, one with an eccentric weight attached to a cog and rack forming a neat little pendulum, and a double beam giving two alternative positions for the letter rack to be hung, so that two sets of graduations must have been on the face for only one pendulous weight. Only the one in the photograph has been seen by the compiler, but as usual with Briais's work, the scales look entirely sensible.



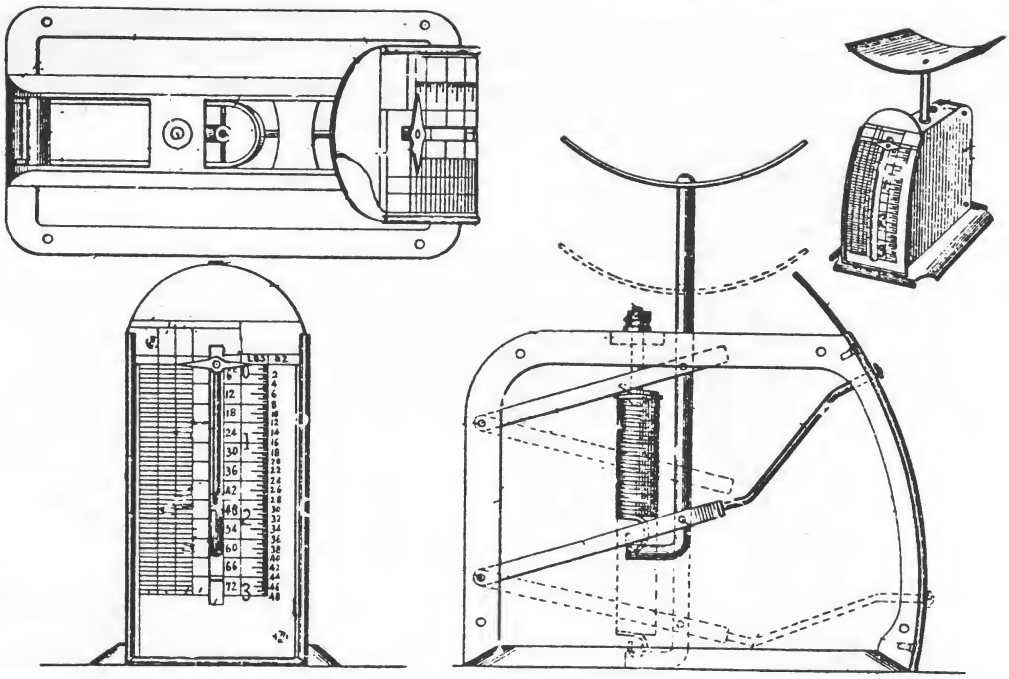
French patent no. 73,126 applied for 29 September 1866, granted 22 November 1866 to Jules Henri WEBER of Paris for two variations on a pendulum letter scale to be held in the hand. The first one was a conventional and elegant one, but the second one had telescopic arms so that the pendulum weight could be pulled out to make it have twice the resistance, and the letter clip could also be pulled out. If the instructions and graduations permitted, the user could have four alternative sets of graduations, one in use with both arms in, one in use with one arm extended and one in use with both arms extended, and one in use with the other arm extended. This seems rather complicated on a letter scale, and it seems more probable that only two sets of graduations were used. Never seen.



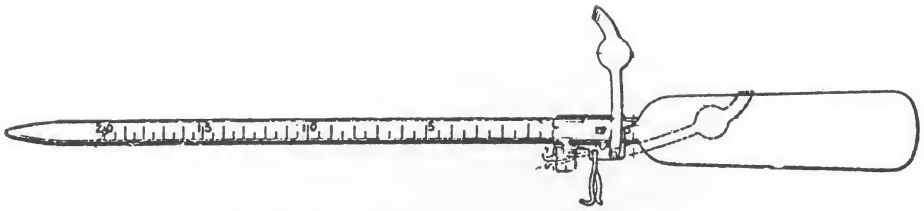


French patent no. 171632 granted 13 January 1885 to M Restorf for a stand mounted pendulum postal scale. In the article in La Nature, issue 1, 1887, Restorf was described as the 'constructeur', but this design was patented by Ragg in Britain in 1871. The example in the photograph was made by Narcisse Briais (NB) and the numerous variations were made by Marion and Co, M and Co. or unknown makers. The features held in common by these variations were a little ball weight (often on an arm,) to keep cogs and pointer in contact, a buffer to stop the pendulous weight from swinging too far under the larger scales, and a very marked enthusiasm for mixing several metals on any one scale. For example, gilding, brass and chrome. They were all beautifully made,handsome and greatly prized by their owners.

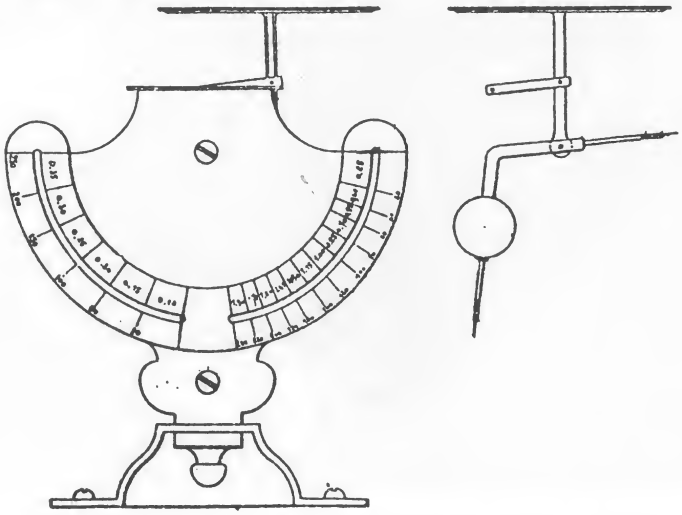
See pages 1410-1412



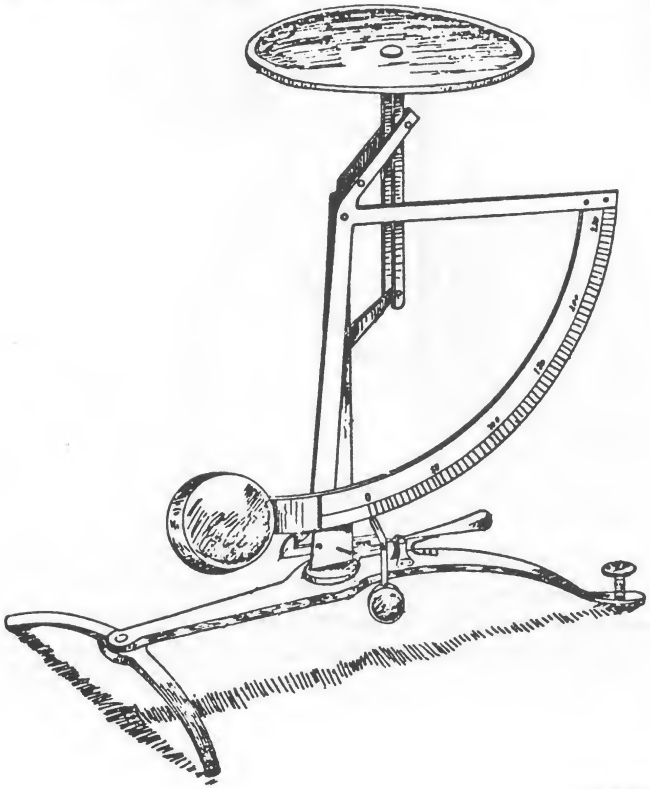
French patent no. 256,884 applied for 1 June 1896, granted 11 September 1896 to Errington Nuell GILFILLAN. This American was wise to patent his idea in France, Britain and the United States, as bow-front spring balances were extremely popular and were made for many years in many variations. The one in the photograph was made of silver in 1922, and marked 'Sold by C Vickery, Regent St. W' (London)

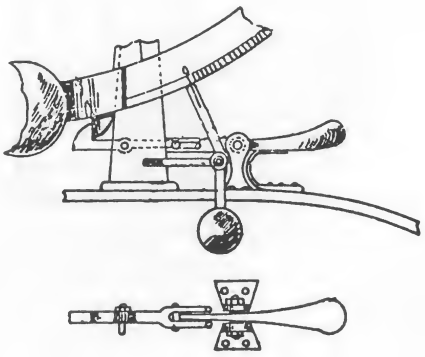


French patent no. 273,669 applied for 11 December 1897 by Robert Hamilton READ for a bismar letter opener/scale. The letter clip and the support hanger were on a saddle through which the beam moved backwards, making the weight the moving part. The graduations did not make it clear that they got closer together as the load got heavier. Never seen.

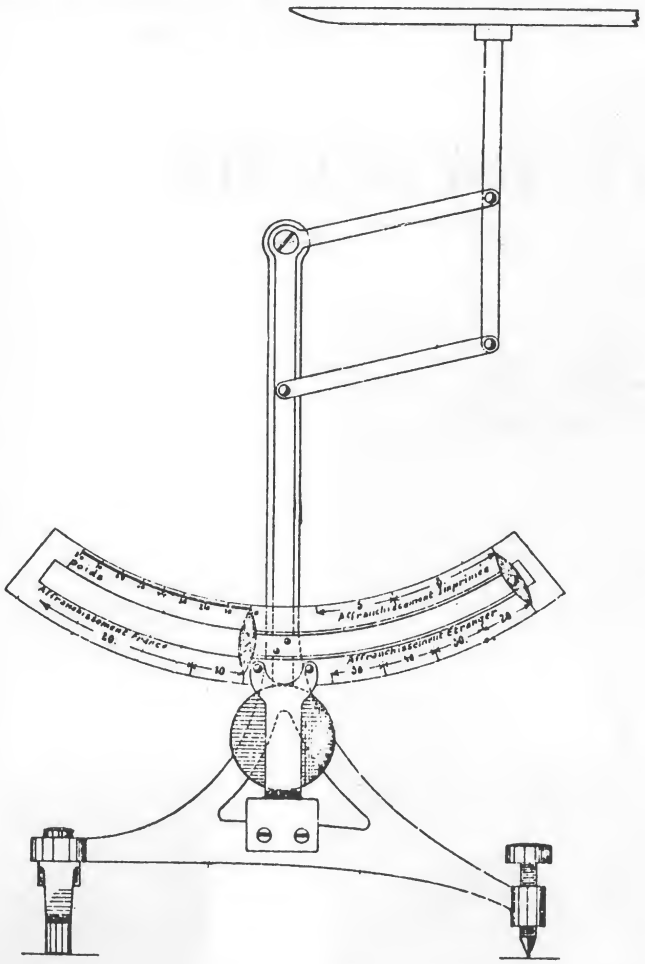


French patent no. 424,557 applied for 3 January 1911, granted 16 March 1911 to Jean ALBINET and Jean AUDOUIN for a pendulum letter balance with a pointer at each end of the bent lever, so that weight was indicated by one pointer and price was indicated by the other pointer. Never seen.

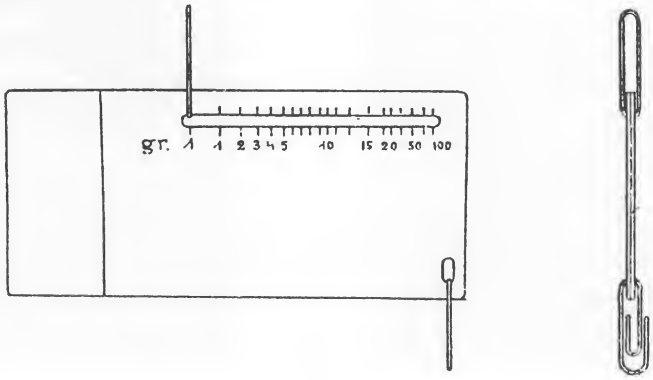




French patent no. 427,026 without dates on the drawing, granted to M GNUCHTEL for a pendulum letter scale of the type made by Maul, but with the addition of a little brake to prevent movement in transit. Never seen.



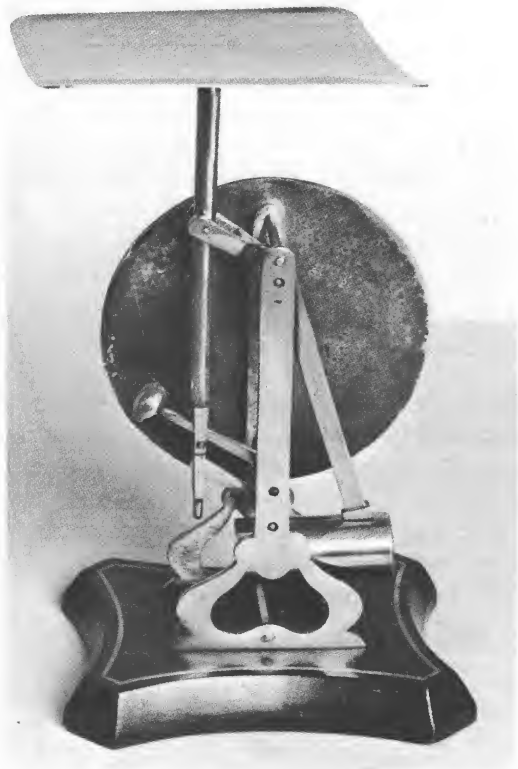
French patent no. 455,511 without dates on the drawing to M Ruhland for a desk top pendulum with a weight shown hanging vertically so that it would move to the left when a letter was placed on the letter plate. Behind the graduation arc was a curved board with two pointers on it, one pointing to the graduations on the left of the centre showing weight and internal French postage rates and the other pointer on the right of the centre showing foreign rates and printed paper rates. Never seen.



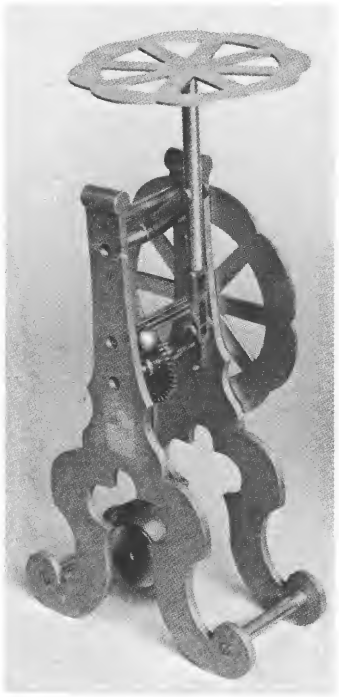
French patent no. 550,654 without dates on the drawing to M Telernitsky for a flat sheet with two slots cut in it for a paper clip by which the pivot point was moved along the gram graduations and a paper clip to hold the letter. The graduations prove that it was a bismar/pendulum. Very cheap to make. Never seen.

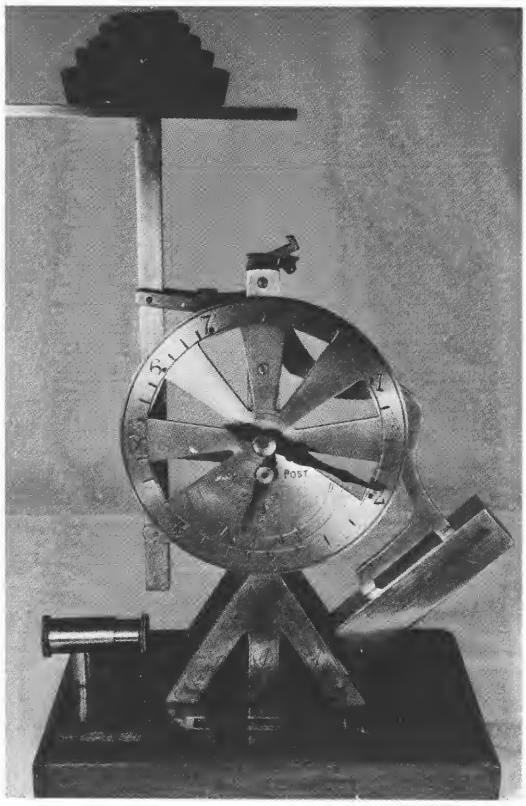
Restorf Variations

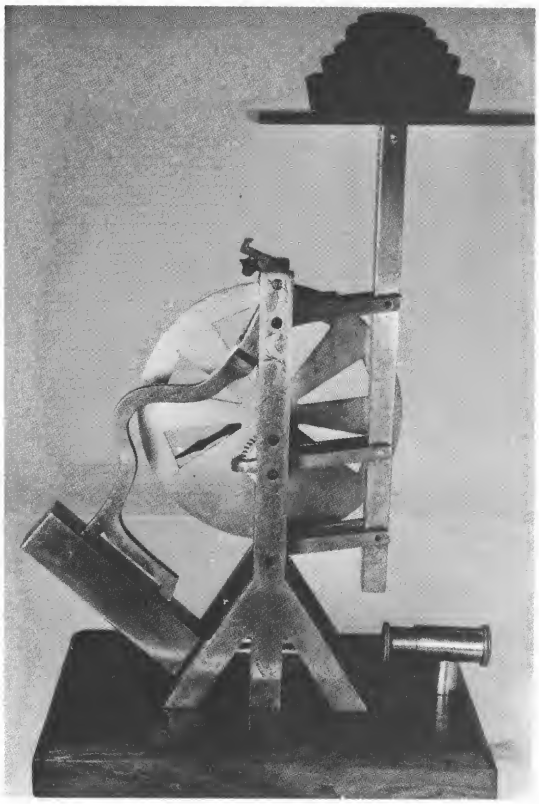
By B STIMPSON

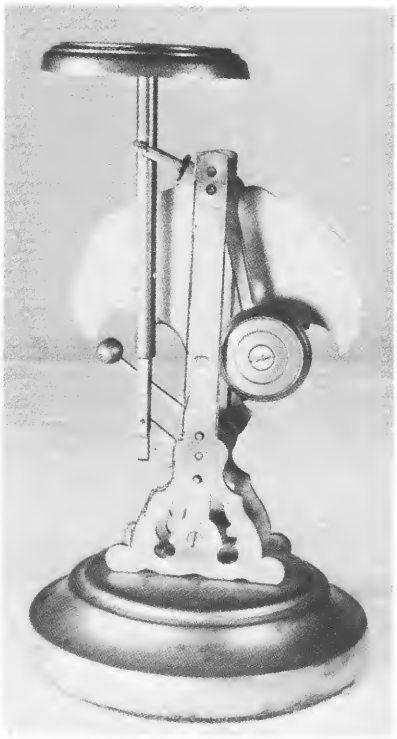


Restorf's patent (see pages 1361-1363,) spawned a great many variations, some of which are shown below. Many have been shown in EQM previously, but they are shown together so that comparisons can be made. Please ignore the black iron weights on top of the letter plate, which were put on the scale to enable the shape of the balance weight to be seen.




POST





These scales were discussed in all their variety by Brian Stimpson at the European chapter of ISASC in May, 1990.